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Demographic dynamics and sustainability*

Report of the Secretary-General

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* This report was prepared by the United Nations Population Fund as task manager for chapter 5 of Agenda 21, with contributions from other United Nations agencies and international organizations. The report is a brief factual overview, which is intended to inform the Commission on Sustainable Development on key developments in the subject area.

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I. Introduction

1. The present report summarizes progress made since the 1992 United Nations Conference on Environment and Development in the area of demographic dynamics and sustainability, including gaps and constraints encountered, and future trends and challenges.

2. Agenda 21[1] and the Programme of Action of the International Conference on Population and Development (1994)[2] recommended actions to ensure the integration of policies concerning population and the environment, addressing the environmental implications of demographic dynamics. They also called for measures to enhance the full participation of relevant groups, especially women, at all levels of decision-making to achieve sustainable management of natural resources. These messages were re-emphasized at the five-year reviews of the two Conferences.

3. In most countries, declining population growth in the 1980s and 1990s has allowed more time to adjust to future population increases and has increased the ability to combat poverty, invest in education and other social services, protect and repair the environment and build the base for future sustainable development. A difference of even a single decade in the transition to a stable population can have a considerable positive impact on sustainability and the overall quality of life.

II. Demographic dynamics

4. The latest United Nations estimates and projections of world population show a continuing slowing of population growth. The world population was estimated at 6 billion in 2000, up from 2.5 billion in 1960, and 4.4 billion in 1980. World population is projected to grow to about 8 billion in 2025 and 9.3 billion in 2050. The world population growth rate has declined from a peak of 2 per cent in 1965 to 1.7 per cent in 1980 and to 1.3 per cent in 2000. It is projected to decline to 1 per cent around 2020 and 0.5 per cent in 2050, with all of the population growth after 2025 occurring in the developing countries.[3]

5. The world's poorest countries tend to have the highest population growth rates, undermining their efforts to invest in human development, reduce poverty and promote sustainable development. Of the 77 million people being added to the world's population each year, most are born in the world's poorest countries in Africa and Asia. Since there will still be significant annual increases in population in the developing world for some decades, the environmental and social implications remain far-reaching for many poor countries, particularly where water is scarce, where population density is already high, and where land degradation and deforestation are most severe. High fertility rates and the resulting high ratio of children to working-age adults make it particularly difficult to meet the international target of providing all children with at least an elementary education.

6. Large movements of people from rural to urban areas are continuing in most developing countries, leading to a growing number of mega-cities which have in many cases overwhelmed the environmental resources of the area and spawned huge peri-urban slums. The urban share of the world population grew from 30 per cent in 1950 to 47 per cent in 2000, and the urban population is growing three times as fast as the rural population.[4] By 2005, half of the world's population is expected to be urban. The implications for development and the environment are profound, as urban authorities strive to provide infrastructure and basic social services, including housing, energy, water, sewage disposal, transportation and communications.

7. Urbanization and other migratory movements affect rural as well as urban communities. In many countries, out-migration of younger rural residents, combined with fertility declines and increases in mortality among younger adults, due to HIV/AIDS, is leading to rapid ageing of rural populations, sharp increases in old-age dependency, and widespread reductions in labour supply. Such changes can result in the economic stagnation of rural regions, adding to the existing disparities between rural areas and cities, and intensifying the relative social and economic vulnerability of rural people.

8. International migration is small compared with internal migration but has a disproportionate impact. Both internal and international migration are driven by economic and social disparities within and between countries and by population pressures. The combination of poverty, rapid population growth and environmental degradation is a powerful destabilizing factor driving rural-to-urban migration and, eventually, international migration. This is most marked in parts of Africa but can also be seen in South Asia and some Latin American countries.

9. The HIV/AIDS pandemic raging across the world, particularly in developing countries, represents a crisis of exceptional proportions. It raises mortality, lowers fertility, creates imbalances in the age and sex composition of populations, and leaves millions of orphans in its wake. Because AIDS takes its greatest toll among young adults, it cuts deeply into the fabric of affected societies and has a devastating impact on human resources, economic productivity, management of natural resources, and social and economic development in general. In a large number of developing countries, HIV/AIDS now represents a major obstacle to economic growth and sustainable development.

10. In Africa, AIDS is now the primary cause of death, with the highest infection rates among people in their twenties and thirties. In southern Africa, life expectancy, which increased from 44 years in the early 1950s to 59 in the early 1990s, is expected to fall back to 45 years by 2010. The HIV infection rate in Africa may now have peaked, in part because of successful prevention programmes in a number of countries. The infection rate in Asia is lower but increasing.

11. The ageing of human populations — growth in the number and proportion of older people due to increasing life expectancy and declining fertility — is one of the most significant demographic processes shaping the world today. In many countries, developed and developing, the ratio of people over age 60 to the working-age population is projected to more than double between now and 2050, creating problems for the financing of pensions, health care and other social support for older persons.

III. Achievements

12. The two United Nations conferences on environment and population and their five-year reviews have increased the focus on population/environment linkages and their development implications. National sustainable development strategies and national conservation strategies which take into account demographic variables are being developed by many countries in the follow-up to the global conferences. An increasing number of countries have formulated local versions of Agenda 21 and are implementing them.

13. Many countries have established a ministerial body or subcommittee charged with addressing population concerns and with integrating them into national development strategies and policies. In some countries, Governments have established a ministry for population and environment, with responsibility for formulating population policy, developing programmes, conducting research and coordinating population, family planning and environment-related activities with various governmental bodies and non-governmental organizations.

14. Countries that have been successfully monitoring progress towards the goals and objectives set forth at the two conferences and the five-year reviews — in particular, progress in integrating population concerns into development strategies — have developed a comprehensive list of indicators and have charged specific ministries, subcommittees or departments with tracking them. Although most countries continue to use traditional economic, social and demographic indicators, many have supplemented them with environmental indicators.

15. Gender issues and their relationship to sustainable development figured prominently at the two conferences and the five-year reviews. Increasing attention is being given to the critical role of women in population and environment programmes and in achieving sustainable development. Agenda 21 and the Programme of Action stress that empowerment of women is essential and that improving the status of women through better access to education, reproductive health, including family planning and sexual health, and jobs will yield high returns through reduced fertility, increased production, and improved environmental management.

16. Computer models and tools have been developed to better understand and address population/poverty/environment linkages. Two models that have received United Nations support for application in developing countries are the Population/Development/Environment (PDE) model, developed by the International Institute for Applied Systems Analysis, and the Threshold 21 model of the Millennium Institute. Among the useful tools for integrating population and environmental factors into development planning are geographic information systems (GIS) which combine mapping data, ecosystem carrying-capacity assessments and ecological risk analysis, together with economic, social and administrative

information, to support integrated development analysis and planning. Participatory action research tools have been designed to help communities assess natural resource management, population dynamics, health status of the population and gender-related factors.

17. In many countries, community-based organizations and other local non-governmental organizations have developed innovative approaches for promoting sustainable livelihoods together with environmental protection and access to health services, including reproductive health. An increasing number of non-governmental organizations are engaged in activities relating to population and environment in the wake of the two conferences.

IV. Gaps and constraints

18. Resource limitations in many countries have constrained the efforts of Governments to address population and environmental concerns. In many countries, conflicts, crises, natural disasters and economic, social and political instability have also limited the ability of Governments to implement Agenda 21 and other global conference results. Breakdowns in governance, inadequate infrastructure and competing financial priorities have reduced access to a range of basic social services, particularly quality health care and reproductive health services.

19. While national sustainable development strategies, including population policies, have been formulated in many countries, much remains to be done in terms of implementation. Countries have cited the following constraints: (a) lack of a cross-sectoral conceptual framework based on the complex interrelationships between population, environment and sustainable development; (b) lack of suitable and accurate data; and (c) lack of financial and human resources to implement policies and programmes.

20. Although some progress has been made, population issues have not been fully integrated into sustainable development policy, planning and programming. In particular, insufficient attention is being paid to the relationship between demographics, environment and poverty, especially as they affect the most vulnerable groups. Analysis of these linkages has been limited by the use of traditional static and linear models that are unable to take into account the dynamics of these factors.

21. Population growth, poverty and environmental degradation are most closely linked in rural areas of developing countries, particularly in rural Asia and Africa where a large majority of world poverty is found. A large majority of the rural poor are dependent on agriculture and natural resources for their livelihoods and sustenance. Declines in per capita arable land and water supply, together with the degradation of soils, forests, grasslands and water quality, are making life increasingly hard for the rural poor, driving out-migration to urban slums and agricultural plantations, and often separating families. The share of development assistance going to sustainable agricultural development has been declining in recent years.

22. While a number of countries have committed financial support to population and environmental concerns, considerable effort is still needed to mobilize the resources required to fund the integrated population, environment and sustainable development activities spelled out in Agenda 21 and the Programme of Action.

V. Future trends and challenges

23. Over the past decade, many countries have made good progress in putting in place population- and environment-related policies and programmes designed to achieve the conference goals. Nevertheless, much remains to be done. Priority should be given to poverty eradication programmes targeted particularly at rural areas, women and female-headed households.

24. There is need to identify population/poverty/environment "hotspots", where poverty and environmental degradation have reached critical thresholds and where population pressures are important contributing factors.

25. Planners and decision makers, especially those working at the local level, need support in developing a better understanding of the causes and cumulative effects of population/environment linkages. They also need support for the development of knowledge and tools aimed at generating the specific and accurate data and analysis needed for policy formulation and decision-making within a coordinated framework that reflects the complex interrelationships, taking into

account the affordability of activities, short-term costs and benefits, and externalities.

26. Women and children experience disproportionately the effects of poverty and environmental stresses. The empowerment of women and their inclusion in policy-making and implementation should be an integral part of policy initiatives for population, environment and sustainable development. Measures that help to increase and ensure their rights, health and welfare are likely to create benefits in all three areas because of their pivotal role in resource management, income generation, child care, education, nutrition and health care.

27. The interrelationships between environmental pressure and migration is drawing increased attention from the international community since the number of persons displaced by environmental degradation is continually rising, as is the level of environmental damage resulting from mass migrations. It is expected that the number of people at risk of environmental displacement will grow. Most of the displaced persons, sometimes referred to as "environmental refugees", live in the African Sahel, the Horn of Africa, other parts of sub-Saharan Africa and South Asia — areas generally characterized by high population growth — and in Mexico and China.

28. The capacity of non-governmental organizations working in the field of population and environment needs strengthening in order to enhance their managerial, technical and administrative capacities to contribute to the implementation of the commitments made at the two conferences. Partnerships between public and private organizations for the further implementation of Agenda 21 and the Programme of Action need to be intensified.

29. Use of the mass media and information technology, including Internet technology, should be expanded so as to increase awareness and understanding of population, environment and sustainable development linkages and to promote gender equality and women's empowerment. Advocacy campaigns should be utilized to build and sustain political commitment for the implementation of Agenda 21 and the Programme of Action. They should convey messages about population, environment and sustainable development in popular, easy-to-understand language.

30. In order to achieve the conference goals, there is need for greater efforts to mobilize resources to implement the activities defined in Agenda 21 and the Programme of Action and to use existing resources effectively and efficiently. Technical assistance is an essential complement to national efforts.

Notes

[1] *Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992* (United Nations publication, Sales No. E.93.I.8), vol. I, resolution 1, annex II.

[2] *Report of the International Conference on Population and Development, Cairo, 5-13 September 1994* (United Nations publication, Sales No. E.95.XIII.7), chap. I, resolution 1, annex.

[3] *World Population Prospects: The 2000 Revision* (To be issued as a United Nations publication.)

[4] *World Urbanization Prospects: The 1999 Revision* (To be issued as a United Nations publication.)

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Information and institutions for decision-making*

Report of the Secretary-General

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Introduction

1. Sustainable development requires new ways of making public policy decisions. It requires a more integrated and holistic approach to economic, social and environmental problems, as evidenced by the amount of attention that Agenda 21,[1] gives to improving the context in which decisions are made. This includes changing institutional and legal frameworks, formulating integrated national sustainable development strategies, and improving information systems that support decision-making. The past 10 years have seen change in these areas.

I. Information for decision-making

2. New information technologies have changed the ground rules for information flow in society. Information has traditionally been limited by the capabilities of the technologies available (printed word, telephone etc.) for its distribution. The Internet and computer-mediated information systems tend to shift the balance of control from suppliers to consumers. Such information systems empower users to make their own decisions, permitting more decentralized and locally adapted forms of management. One result has been the rapid growth in non-governmental organizations and other new structures in civil society that expand the scope of public participation in decision-making.

3. Major initiatives have been launched to improve environmental observations and data collection, ranging from ozone monitoring under the Montreal Protocol on Substances that Deplete the Ozone Layer[2] and implementation of the three Global Observing Systems, to monitoring of forests and coral reefs by non-governmental organizations. There have also been efforts to improve coordination and cost-effectiveness, such as through the Integrated Global Observing Strategy. However, these efforts are badly under-funded relative to the need for improved data in response to global data needs such as the requirements of multilateral environmental agreements.

4. Progress can be reported in the production of more integrated and forward-looking assessments of environment and sustainable development, including the report of the Secretary-General (E/CN.17/1997/3 and Corr.1) entitled "Global change and sustainable development: critical trends", prepared for the five-year review of the United Nations Conference on Environment and Development in 1997, the United Nations Environment Programme (UNEP) *Global Environment Outlook* reports, and the *World Resources* reports (UNEP/World Resources Institute/United Nations Development Programme (UNDP)/World Bank. However these reports need improved core data sets at the international level for many topics, to enhance the conclusions that can be drawn from the available information.

5. Significant progress has been made both internationally and nationally in the development of indicators as tools to support national decision-making processes. One example is the Commission on Sustainable Development work programme on indicators of sustainable development, which represents the largest United Nations system-wide and country collaboration to date in the development of an indicator framework and methodology based on a consensus among more than 30 participating agencies, international organizations and Governments. It is hoped that countries will increasingly use indicators in monitoring implementation of their national sustainable development strategies and in strengthening the factual foundation of their national reports to the Commission.

6. Another factor is the continuing technical progress in environmental observing and monitoring systems. Satellite remote sensing with ever more refined instruments and improved resolution and coverage, drifting buoys with autonomous instrument packages transmitting their measurements in real time, and more powerful computers allowing the increasing integration of data into complex models and decision-support systems such as geographical information systems (GIS), are making global data more accessible. The institutional capacity to coordinate all this is also growing through initiatives such as the Integrated Global Observing Strategy Partnership, the Global Observing Systems and global research programmes.

7. New avenues have opened for preparing and presenting information in formats more easily understood by decision makers and the general public. Multimedia technologies, software packages, and tools such as indicators and animated graphical presentations are assisting decision makers in their sustainable development efforts. The development and use of GIS and map-based information tools have expanded rapidly in recent years. They provide helpful planning

tools allowing for visual assessment of impacts and of resources available to address problems and environmental emergencies.

8. Rapid progress in information systems has increased concern for the widening gap, the so-called digital divide, between the "haves" and the "have nots" in the information revolution. The most obvious gap is due to the deficiencies in the coverage of technological and communications systems for transmitting information.

9. A second, but continuing, information gap since Rio concerns basic data about our environment and the pressures from human activities. Even in the industrialized countries, data are often too limited or too disparate to be usable. In developing countries, even the most basic statistics are often lacking. No assessment or decision-support system can deliver results that are better than the quality of the inputs. Even where new technologies are generating masses of data, the capacity to analyse and use them is often lagging behind.

10. The new flood of information from remote sensing and other instruments is not being matched by a similar investment in the on-site collection of corroborating data and in the capacity to assess and add value to that information. Despite all the wonders of automation and artificial intelligence, there is still an important role for well-trained minds and mature experience, requiring an investment in people as well as technologies, as an integral part of an effective information system.

11. Developing the potential and participation of civil society groups will require more robust and adapted technologies, improved information packaging, and new marketing strategies. Specific policies are also needed to address the eradication of poverty in terms of the role that information and information technologies can play.

II. Legal and institutional structures and mechanisms for decision-making

A. International level

12. Global legally binding instruments on sustainable development concluded after the United Nations Conference on Environment and Development have worked to advance the objectives of Agenda 21 and towards amplifying the legal framework supporting sustainable development. Among the more prominent are:

(a) United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, particularly in Africa (1994);[3]

(b) Convention on Nuclear Safety (1994);[4]

(c) Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (1995);[5]

(d) Convention on the Law of the Non-navigational Uses of International Watercourses (1997);[6]

(e) Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (1997);[7]

(f) Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (1998);[8]

(g) Protocol on Liability and Compensation for Damage Resulting from the Transboundary Movements of Hazardous Wastes and their Disposal (1999) to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal;[9]

(h) Cartagena Protocol on Biosafety (2000);

(i) Convention on persistent organic pollutants, to be adopted in May 2001.

13. The 1997 Kyoto Protocol[10] to the United Nations Framework Convention on Climate Change[11] has been the focus of particular attention because of its role in strengthening the international response to climate change. Adopted by consensus at the third session of the Conference of the Parties to the Convention on 11 December 1997, it contained new emission targets for Annex I (developed) countries for the post-2000 period. By arresting and reversing the upward trend in greenhouse gas emissions that started in these countries 150 years ago, the Protocol holds promise with respect to moving the international community closer to

achieving the Convention's ultimate objective of preventing "dangerous anthropogenic (man-made) interference with the climate system" (article 2).

14. As of November 2000, only 31 States (all developing countries) had ratified the Kyoto Protocol. The sixth session of the Conference of the Parties to the United Nations Framework Convention on Climate Change left a variety of issues unresolved. Future sessions will have to decide on matters such as rules for the Protocol's clean development mechanism (article 12), its joint implementation and emissions trading systems, and other key issues.

15. The General Assembly on the occasion of the five-year review of the United Nations Conference on Environment and Development highlighted the need for greater collaboration and synergy among the various international conventions and agreements as a means to enhance their overall impact and effectiveness. UNEP, the United Nations Development Programme (UNDP) and the United Nations University (UNU) have sought to promote such coordination through meetings and discussions among the interested secretariats and United Nations system agencies. Such discussions have recognized that a certain degree of coordination already exists through joint projects undertaken between several convention secretariats, but continuing effort is required in this area.

16. In addition to the above, a variety of non-binding international instruments and mechanisms have been developed to complement the legally binding instruments. These include: the 1994 Code of Ethics on the International Trade in Chemicals, the 1995 UNEP International Technical Guidelines for Safety in Biotechnology[12] and a number of voluntary codes of conduct for industry and business developed by UNEP. The 1995 Global Programme of Action for the Protection of the Marine Environment from Land-based Activities[13] provides an international mechanism to complement the 1982 United Nations Convention on the Law of the Sea[14] in its implementation of the provisions governing marine pollution from land-based sources. A number of new protocols to the existing regional seas conventions have also been developed since the United Nations Conference on Environment and Development.

17. Also, in October 2000, the Economic and Social Council established the United Nations Forum on Forests (UNFF), with universal membership (see Council resolution 2000/35 of 18 October 2000). UNFF is the first new subsidiary body of the Council created since the establishment of the Commission on Sustainable Development in 1993. The main objective of UNFF is to promote the management, conservation and sustainable development of all types of forests and to strengthen long-term political commitment to this end.

18. Throughout the 1990s, the UNEP Programme for the Development and Periodic Review of Environmental Law for the 1990s (the "Montevideo Programme II") has been instrumental in the development of environmental law that addresses the sources of the problems in environment and sustainable development.

B. National level

1. Legal instruments

19. To implement international legal instruments, the parties thereto are required to undertake national legal or administrative measures in accordance with the provisions of such instruments. Such measures may be carried out in the form of, for example, national legislation, institutional arrangements and action plans.

20. Developing countries often require technical assistance to develop their own national environmental legislation and institutions. To meet such needs, UNEP, through its Montevideo Programme and in partnership with UNDP, the Food and Agriculture Organization of the United Nations (FAO), the World Bank, the International Union for Conservation of Nature and Natural Resources — World Conservation Union (IUCN) and other relevant organizations, has provided technical assistance and expert advice to them, including advisory services for the preparation of draft environmental laws and revision of the existing laws as well as training and awareness-raising activities.

21. A number of the secretariats of conventions such as the Basel Convention, the Vienna Convention for the Protection of the Ozone Layer, and the United Nations Convention on the Law of the Sea have prepared model national legislation, regulations and guidelines for the implementation of certain provisions of these conventions.

22. UNEP, the United Nations Institute for Training and Research (UNITAR) and the United Nations Centre

for Human Settlements (Habitat) have cooperated with a number of other United Nations and international bodies in conducting training programmes in environmental law and administration at global regional and national levels to assist in the formulation of legislation and policy.

23. Amendments to national regulatory frameworks have contributed to greater political integration of the sustainability dimension (constitutions, laws and regulations). Among the factors contributing to these amendments are: the growing participation of local governments resulting in the formulation and implementation of local sustainable development agendas; progress in intersectoral cooperation and coordination, which has promoted the integration of various sectoral public policies in relation to the concept of sustainable development; and regional sustainable development initiatives.

24. One of the major needs in all countries is the development of a framework of national laws and regulations, policy guidelines and relevant institutional frameworks to support the sustainable development process in its entirety. Whereas most countries already have some process in place to develop integrated strategies and develop plans on a regular basis, fewer have comparable routine processes in the area of law.

25. Legislative reform requires a strong cadre of people trained in law and well versed in the demands of sustainable development. There is little evidence that these cadres exist to any great extent in most countries. Much of the lawmaking on sustainable development seems to be ad hoc and piecemeal or has not been endowed with the necessary institutional machinery and authority for enforcement and timely adjustment.

2. National sustainable development strategies

26. The concept of national sustainable development strategies was introduced in Agenda 21 and the call for them was further strengthened in the Programme for the Further Implementation of Agenda 21,[15] including setting a target for the formulation of such strategies by the year 2002 (para. 24 (a) of the Programme). While no single model has been agreed, the purpose of national sustainable development strategies is to build upon and harmonize the various sectoral economic, social and environmental policies and plans that are operating in the country.

27. The key idea is to unify and integrate economic, social and environmental issues in decision-making by bringing together in the strategy process governmental ministries and decision makers representing finance, planning, environment, health and other key ministries as well as sectors of civil society that have a stake in policy outcomes. According to national reports received from Governments, about 85 countries have produced national Agenda 21 plans, national sustainable development strategies or environmental action plans.

28. The establishment in some countries of participatory institutional structures or forums such as national councils for sustainable development or inter-ministerial commissions, among others, has had some impact on high-level decision-making and in consensus-building for the formulation and implementation of national sustainable development strategies.

29. UNDP, through its Capacity 21 programme initiated in 1993, has played an important role in building the capacities of developing countries to formulate and implement national strategies of sustainable development. Capacity 21 has worked in close partnership with Governments, civil society and the private sector to develop country-owned, country-driven processes that influence and support national sustainable development processes.

3. National councils of sustainable development

30. Since the Earth Summit in 1992, some 70 countries have created national councils of sustainable development or comparable structures. The character, composition, structure and purpose of national councils of sustainable development differ considerably from country to country and region to region and their impact on policy-making and the preparation of national sustainable development strategies is uneven. Moreover, councils still do not exist in many countries.

31. Despite differences, national councils have tended to undertake four essential tasks: (a) facilitating the participation of civil society in government decision-making, (b) promoting an integrated approach to economic, social and environmental issues, (c) localizing global agreements and (d) assisting civil society in United Nations processes and deliberations.

32. National councils face certain constraints and tensions that limit their effectiveness including

(a) competing priorities within the government and among civil society groups, (b) the lack of human and financial capacity, (c) the difficulty of forging a consensus among contending interests, (d) the lack of representation of all groups, (e) the lack of sufficient political will at the highest political level, (f) the different roles and responsibilities of Governments and civil society, (g) the lack of expertise on all the topics covered by sustainable development, and (h) the difficulty of integrating the local, regional, national and international dimensions of the sustainable development process.[16]

III. Issues for further consideration

33. The System of integrated Environmental and Economic Accounting (SEEA) developed by the United Nations Statistics Division of the Department of Economic and Social Affairs of the United Nations Secretariat will require further work and adoption, as appropriate, by a broader range of countries.

34. There is continuing need for the harmonization and rationalization of reporting requirements. Efforts are under way by the Economic and Social Council and elsewhere to standardize development data in an attempt to address the growing number of data requirements of United Nations system programme activities. There is also a critical lack of basic statistical data at the country level and an urgent need to build and enhance national statistical capacity.

35. To integrate environment and development in the policies and practices of each country effectively, it is necessary to develop and implement integrated, enforceable and effective laws and regulations that are based upon sound social, ecological, economic and scientific principles. Programmes also need to be established to review and enforce compliance with the laws, regulations and standards that are adopted.

36. While it seems unlikely that countries will agree to an overarching, unitary structure for global governance in the area of international conventions and agreements, further study and interaction among countries is required to see how coordination and cooperation between the conventions can be further enhanced.

37. There is need to address trade-related aspects of environmental protection and sustainable development. The interrelationship between the trade-related provisions of multilateral environmental agreements and international trade rules under the General Agreement on Tariffs and Trade (GATT)/World Trade Organization need to be actively examined at international forums in the context of the development and implementation of the multilateral environmental agreements and the World Trade Organization.

38. Further work is needed to prepare internationally agreed guidelines and criteria for national sustainable development strategies.

39. Building institutional capacity across ministries and departments to achieve an integrated approach to economic, social and environmental goals of sustainable development remains a significant challenge to be addressed.

40. The wide diversity among national councils of sustainable development presents special challenges in developing common approaches and goals. There is need, as appropriate, to promote greater networking among national councils at the regional and subregional levels.

41. In accordance with General Assembly resolution 55/199 of 20 December 2000, preparations for the 2002 World Summit on Sustainable Development should, inter alia, address ways of strengthening the institutional framework for sustainable development and evaluate and define the role and programme of work of the Conference on Sustainable Development. Sustainable development provides an overarching framework for United Nations system-wide activities in the economic, social and environmental fields. Achieving sustainable development also involves a broad range of global and regional development and financial institutions. It calls for strengthened local, national, regional and international institutional structures that further promote policy integration and participation and thereby support more effective systems of governance for sustainable development at all levels. Suggestions on these issues will be forthcoming in the Secretary-General's report prepared for the next sessions of the Commission acting as the preparatory committee for the Summit. A particular contribution to the preparatory process is also expected from the Intergovernmental Group established by the UNEP Governing Council/Global Ministerial Environment Forum to present options for strengthened international environmental governance, which is an

important component of a more effective institutional framework for sustainable development.

Notes

[1] *Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992*, vol. I, *Resolutions Adopted by the Conference* (United Nations publication, Sales No. E.93.I.8 and corrigendum), resolution 1, annex II.

[2] United Nations, *Treaty Series*, vol. 1522, No. 26369.

[3] A/49/84/Add.2, annex, appendix II.

[4] See International Atomic Energy Agency, INFCIRC/449.

[5] *International Fisheries Instruments* (United Nations publication, Sales No. E.98.V.11), sect. I; see also A/CONF.164/37.

[6] General Assembly resolution 51/229 of 21 May 1997, annex.

[7] See GOV/INF/821-GC(41)/INF/12, appendix I.

[8] UNEP/FAO/PIC/CONF/5, annex III.

[9] United Nations, *Treaty Series*, vol. 1673, No. 28911.

[10] FCCC/CP/1997/7/Add.1, decision 1/CP.3, annex.

[11] A/AC.237/18 (Part II)/Add.1 and Corr.1, annex I.

[12] See UNEP/Global Consultation/Biosafety/4, annex II.

[13] A/51/116, annex II.

[14] *Official Records of the Third United Nations Conference on the Law of the Sea*, vol. XVII (United Nations publication, Sales No. E.84.V.3), document A/CONF.62/122.

[15] General Assembly resolution S-19/2, annex.

[16] See report of the International Forum of National Councils of Sustainable Development (NCSDs) held from 17 to 19 April 2000 in New York under the joint sponsorship of the Department of Economic and Social Affairs of the United Nations Secretariat and the Earth Council.

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Major groups*

Report of the Secretary-General

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* This report was prepared by the Department of Economic and Social Affairs of the United Nations Secretariat as task manager for chapters 24-32 of Agenda 21, with contributions from United Nations agencies, international organizations and major groups. The report is a brief factual overview, which is intended to inform the Commission on Sustainable Development on key developments in the subject area.

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I. Introduction

1. This report reviews main accomplishments and constraints related to the participation of major groups in sustainable development. The progress made by the specific major groups identified in Agenda 21[1] is covered in reports prepared by the groups themselves for the planned multi-stakeholder dialogues for the World Summit on Sustainable Development preparatory process. Two additional background papers will supplement the present report: an analytic review of the multi-stakeholder dialogue segments of the Commission on Sustainable Development, conducted by the Consensus Building Institute/Massachusetts Institute of Technology (MIT) and the Department of Economic and Social Affairs of the United Nations Secretariat; the second worldwide survey of local Agenda 21 initiatives conducted by the International Council for Local Environmental Initiatives (ICLEI), Capacity 21/United Nations Development Programme (UNDP) and the Department.

2. When it adopted Agenda 21, the United Nations Conference on Environment and Development introduced the major groups concept, by which the global community acknowledged that achieving sustainable development would require broad-based participation and partnerships with non-governmental actors.[2] To facilitate such participation, Agenda 21 linked the nine major groups, with specific roles and responsibilities in the follow-up process, and described the type of support and collaboration they could legitimately expect from Governments and intergovernmental organizations.

3. The two main elements of the major groups concept are participation in decision-making, and new forms of participation. The first refers to the active presence of major groups in the design, execution, and monitoring of sustainable development follow-up activities at all levels, going beyond the passive exchange of information. Such active participation would create the basis for transparency and accountability necessary in sustainable development efforts. The second demands a continuous search for optimal mechanisms of engagement which are meaningful, influence outcomes and generate partnership. Creating such mechanisms will require changes in the way economic, social, environmental, and political debate and discourse takes place.

II. Main accomplishments

4. During the first 10 years of follow-up to the Conference, many governmental, non-governmental and intergovernmental institutions have successfully experimented with new forms of participation and with participation in decision-making at the international, regional, national and local levels.

5. At the international level, positive trends include further recognition of major groups as genuine partners, developments in formalizing partnerships with various major group actors by the United Nations and non-United Nations international organizations, the new participatory practices created by the Commission on Sustainable Development, and the dissemination of those new practices within the United Nations system.

6. Major United Nations conferences following the United Nations Conference on Environment and Development further recognized that stakeholders are crucial partners in the pursuit of global objectives.[3] In some, this recognition took a more tangible form within the conference proceedings. For example, at the Global Conference on the Sustainable Development of Small Island Developing States held in 1994, non-governmental actors played an active role in the drafting of the final outcome. Similarly, Habitat II, in 1996, formally recognized the private sector, local communities and local authorities as key partners for the work on the human settlements agenda.

7. This growing recognition of participation and partnership has led a number of United Nations organizations to formalize, codify, and clarify the framework of their collaboration with various major groups. For example, during the past 10 years, the United Nations Development Programme (UNDP), the Food and Agriculture Organization of the United Nations (FAO), the United Nations Environment Programme (UNEP), among others, have developed guidelines, codes and other strategic documents to better define and systematize their engagement with non-governmental organizations and other major groups. Similar efforts have also been made by regional banks, such as the Asian Development Bank and Inter-American Development Bank, and by regional political institutions, such as the Organization of American States.

8. Similarly, the World Bank has deepened its engagement with a range of non-governmental

organizations working on environment, development, human rights, social development and health issues. The World Trade Organization (WTO), especially after serious criticism by a range of civil society groups, including non-governmental organizations, trade unions and religious groups, has been showing signs of opening up to consultations with civil society representatives. A broad range of stakeholders has been actively involved in the various Conventions on climate change, biological diversity and desertification. The Organisation for Economic Cooperation and Development (OECD) has initiated informal consultation processes with non-governmental organizations, to complement its formal consultative process with business and trade unions. Institutional changes, such as the creation of non-governmental organization or civil society focal points or units, often supplement those efforts in a tangible way and with a long-term focus.

9. In the context of new participatory practices, the Commission on Sustainable Development has been a "pathfinder", building on participatory experiments at the national and local levels.[4] The Commission's multi-stakeholder dialogue segments, launched at the sixth session in 1998, have provided opportunities for major groups and Governments to share views, experiences, and concerns, and to generate shared commitments.[5] A particular strength of the dialogue segments has been their clear substantive focus on an economic sector (such as tourism, agriculture, or energy) linked with the agenda of the annual session of the Commission. Feedback from Governments and major groups indicate that the segments have made the Commission a more accessible, open and transparent intergovernmental process, relative to all other similar bodies.

10. Requests made by the Commission and the growing recognition of the dialogue segments as an innovative mechanism led other United Nations organizations to explore ways to incorporate multi-stakeholder processes in their work. Examples of such efforts include a multi-stakeholder process to review voluntary initiatives launched by the Commission in 1998 and currently led by UNEP; a multi-stakeholder working group on tourism, created in 1999 and jointly led by the World Tourism Organization, UNEP, the Department of Economic and Social Affairs, major groups and Governments; and a multi-stakeholder dialogue in the Committee on Agriculture of FAO early in 2001.

11. At the national and local levels, the national councils of sustainable development and the local Agenda 21 initiatives have been successful incubators and generators of new participatory practices. The councils, which exist in 70 countries, as coordination mechanisms, have provided opportunities to build consensus on national priorities and helped to create a broad-based sense of ownership of sustainable development work at the national level. They have also opened avenues for major group participation in decision-making at the national level.

12. The rapidly expanding numbers of local Agenda 21 initiatives continue to serve as successful models of public participation in cities, towns and local communities. (The first worldwide survey of the initiatives, conducted in 1996 by ICLEI and the Department of Economic and Social Affairs revealed a total of 1,812 initiatives in 64 countries.[6]) A specific requirement of the initiatives is multi-stakeholder engagements and processes. As a result most initiatives have emerged out of a participatory process, involving a cross-section of local community and business leaders.

13. These trends are likely to continue, given the positive feedback from the stakeholders involved and the analyses of their experiences so far. Numerous case studies conducted over the past decade have demonstrated that when a broad range of stakeholder groups are actively involved in programme design, implementation and monitoring and are accountable to each other on decisions or activities they undertake, the results are more sustained than would otherwise be the case. Participation generates shared values, mutually reinforced commitments, and joint ownership, which, in turn, effectively breaks the traditional pattern dividing stakeholders into "recipients" and "providers".

14. Within the community of major groups at large, positive trends include emerging partnerships between major groups (in particular, between civil society and the private sector), changes in the approach of business and industry to sustainable development, the rapid growth in the non-governmental sector, and additional responsibilities being assumed.

15. Prior to the Earth Summit, it was largely assumed that partnerships between certain major groups, particularly between non-governmental organizations and business and industry, would be unlikely. This assumption has been revised. Partnerships involving

individual companies and non-governmental organizations have generated normative frameworks, in the form of voluntary initiatives and guidelines for responsible business practices or practical results through programmes aiming for more efficiency in resource use. The Global Compact initiative, launched by the United Nations in 1999, has brought a degree of "universality" to these efforts, by setting the stage for potential partnerships between the United Nations, the business community, and the international labour and civil society organizations. The Compact asks corporations to adopt, in their global operations, good practices, identified by the broader international community, in the areas of human rights, labour standards and the environment.

16. These partnerships and initiatives have led to both positive and negative reactions from major groups at large. For example, while a number of non-governmental organizations and other major groups actively support the Global Compact, there are those that are critical of its lack of transparency in the initial design phase or lack of an accountability framework to monitor its implementation phase. There is continuing disagreement in the greater community of non-governmental organizations on the extent to which they should engage in partnership with businesses. A similar disagreement exists within the greater business community. These differing views signal the need for continued debate, dialogue and exploration of possibilities, involving all concerned parties, to identify and develop the "optimal" mechanisms for participation, partnership and consensus-building in sustainable development. Accountability and transparency are likely to be key issues in that debate.

17. The number of actors in the non-governmental sector has been on the rise, particularly during the past decade. The actors are better networked, in focused and targeted ways, based on common objectives that transcend national or geographical boundaries. Access to electronic information networks has been a significant factor in their strength. The non-governmental networks are generating new pressure points in the global sustainable development process by enabling strong positions to be developed and disseminated more rapidly and effectively than was possible only 10 years ago.

18. Although a full mapping and analysis of the non-governmental sector in sustainable development — or in other global programmes — has not been carried out, there is evidence that non-governmental organizations and others in this sector increasingly provide public goods and services in the social and environmental fields, particularly at the national and regional levels. Many non-governmental organizations are programme delivery agents for various bilaterally or multilaterally funded national or local projects, often working in partnership with national Governments. Various businesses also provide public services, due in part to privatization and market liberalization programmes. These "new" areas of service, provided by non-governmental and private sector entities, are signalling possible changes in the way state and society relate to and work with each other. What these changes might mean for governance in relation to sustainable development and how they might be channelled to further benefit sustainability objectives need to be further explored.

III. Main constraints

19. Major group participation in sustainable development continues to face numerous constraints. Among them are geographical imbalances in participation, particularly at the international level, growing dependence on mainstream major groups as intermediaries, the need for further work on setting accountable and transparent participation mechanisms, lack of meaningful participation in decision-making processes, and lack of reliable funding for major groups.

20. Despite efforts to support and increase participation by major groups from developing countries and from countries with economies in transition, the majority of stakeholder participants in intergovernmental processes, including the Commission, continue to be from developed countries. Funding is an important factor — but not the only factor — for this "geographical divide". The institutional and substantive capacities of major groups from the "south" to participate effectively are equally important and need urgent attention. Empowerment and capacity-building efforts at the national and regional levels may be a step towards closing the "geographical divide".

21. A closely related problem is overdependence on the representatives of major groups that are well acquainted with the workings of governmental and intergovernmental machinery and that often act as

intermediaries for those not so well acquainted. This effectively leaves many local and national voices unheard or heard only through the intermediaries. As a result, the full diversity of views and visions is not brought into the discourse on sustainable development. Exploring and creating incentives that encourage the more mainstream stakeholder organizations to mobilize new non-governmental leadership and to revitalize their links with the grass roots may reduce this dependence.

22. There continue to be gaps in accountability, despite much discussion of the problem. In many cases, the civil society and business actors that demand accountability from Governments do not always offer the same accountability from within. In light of the demands of major groups to take part in decision-making processes and be genuine partners in sustainable development, there needs to be further work on and commitment to mechanisms of mutual accountability which apply equally to all actors.

23. The participation of major groups over the past 10 years has been largely ad hoc, lacking clear and formalized mechanisms for their full engagement in making decisions and implementing them. This constraint particularly affects the local and national major groups that feel marginalized, in terms of sustainability issues, in their communities and countries. Similarly, at the international level major group participation is still largely limited to a passive exchange of information. Sustainable development processes at all levels need to expand the available participation mechanisms so as to allow more meaningful contributions from major groups, including their participation in making decisions that affect their communities.

24. Except for those funded through membership fees or private contributions, most major groups depend on bilateral and multilateral institutions to fund their work. This leads non-governmental organizations and other major groups to design projects that respond to donor priorities rather than to their own priorities and needs. Repeated studies in recent years have highlighted the need for donors to take a more strategic and long-term view of funding support for civil society actors, particularly highlighting their capacity- and institution-building needs.

IV. Issues for further consideration

25. The future growth and success of major groups in sustainable development require sound mechanisms of consultation, dialogue, partnership and access to the decision-making processes. These mechanisms are likely to work better and generate genuine results in the long term if they emphasize mutual accountability and transparency among all parties involved.

26. Multi-stakeholder dialogues and processes should be closely linked to decision-making processes, with a focus on reconciling the conflicting interests of participating constituencies as they define and implement strategies and programmes for sustainable development. A particular area to explore is how the Commission's multi-stakeholder dialogues can be further enhanced. Several possibilities might be considered. For example, the dialogues could be used as a forum that enhances the partnerships needed in the development, implementation and monitoring of thematic international work programmes. This is likely to increase the level of commitment and partnerships under the work programmes. Multi-stakeholder processes could also be considered as possible mechanisms to review more effectively the implementation of actions that the various parties have already agreed to undertake.

27. A concerted effort to disseminate multi-stakeholder processes at the regional and national level is needed. In this context, the adoption of major groups as the basis for participation by international and regional organizations may be useful.

28. Given the growing interest and engagement of the United Nations system with various stakeholders, it may be necessary to explore inter-agency mechanisms that specifically focus on coordinating and strengthening the United Nations work with major groups in the area of sustainable development.

29. In accordance with General Assembly resolution 55/199, preparations for the Summit in 2002 should, inter alia, address ways of strengthening the institutional framework for sustainable development. Specific suggestions in this regard would be included in documentation prepared for subsequent meetings of the Commission at its tenth session, acting as the preparatory committee for the Summit. One of the many challenges in this area is to find ways of enhancing meaningful and practical involvement of

major groups in sustainable development governance structures at various levels, both national and international. Another is generating new participatory mechanisms aimed at implementation of national, regional and international programmes of action in the area of sustainable development. It would be important to build on the lessons learned since the United Nations Conference on Environment and Development, including those in the Commission, by further promoting such elements as multi-stakeholder involvement in policy formulation and multidisciplinary focus on issues integrating social, economic and environmental aspects; and by supporting participatory mechanisms in which all of the parties involved are committed to transparency and mutual accountability and responsibility.

Notes

[1] See *Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992* (United Nations publication, Sales No. E.93.I.8), vol. I, resolution 1, annex II. The groups are women, children and youth, indigenous people, non-governmental organizations, local authorities, workers and trade unions, business and industry, scientific and technological communities and farmers.

[2] Ibid., para. 23.1.

[3] The Global Conference on the Sustainable Development of Small Island Developing States, the International Conference on Population and Development, the Fourth World Conference on Women, the World Summit for Social Development, and the United Nations Conference on Human Settlements (Habitat II).

[4] The original idea of multi-stakeholder processes first appeared from within the local Agenda 21 process, which emphasized involvement of a cross-section of local stakeholders with the local authorities. At the national level a similar set of experiences emerged from the national councils for sustainable development. The contribution of the Commission was to bring the local and national experiences to the international level, by embracing multi-stakeholder dialogues as part of its annual programme of work.

[5] Further information on the lessons learned will be available in December 2001, in a background paper currently being prepared by the Consensus Building Institute/MIT and the Department of Economic and Social Affairs.

[6] A second worldwide survey is currently under way as a joint project of ICLEI, Capacity 21/UNDP and the Department of Economic and Social Affairs. The results will be available in December 2001.

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Combating poverty*

Report of the Secretary-General

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* This report was prepared by the Department of Economic and Social Affairs of the United Nations Secretariat as task manager for chapter 3 of Agenda 21, with contributions from United Nations agencies and international organizations. The report is a brief factual overview, which is intended to inform the Commission on Sustainable Development on key developments in the subject area.

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I. Introduction

1. Combating poverty has been a central theme of recent United Nations conferences and summits, particularly the 1992 United Nations Conference on Environment and Development, the 1995 World Summit for Social Development, and the 2000 Millennium Summit. The Millennium Declaration included a commitment to halve by the year 2015 the proportion of the world's population whose income is less than $1 per day.[1]

2. Poverty is a multidimensional phenomenon, characterized by low income and low consumption, hunger and malnutrition, poor health, lack of education and skills, lack of access to water and sanitation, and vulnerability to economic and social shocks. These characteristics are closely associated with one another: low income restricts access to basic goods and services, and lack of access to goods and services limits income-generating opportunities. Poverty is often associated with other social factors such as race, ethnicity and gender, reflecting actual or historical patterns of discrimination against certain social groups.

3. In recent decades, poverty rates, measured in various ways, have fallen in the world and in most countries — dramatically so, in some countries. However, poverty has increased in other countries, and the gap between the richest and poorest countries has increased.

II. Trends in income poverty

4. Between 1990 and 1998, the poverty rate in developing countries, based on a global poverty line of $1 per day, declined from 29 per cent to 23 per cent. If that rate of decline could be maintained, the poverty rate in 2015 would be just about half of the 1990 rate. The total number of people in poverty declined slightly in the 1990s, from about 1.3 billion to 1.2 billion.[2]

5. While the global poverty line of $1 per day does not reflect the income and consumption needed to be considered non-poor in high- or middle-income countries, it applies in some of the poorest countries and thus serves as a useful indicator of the extent of extreme poverty in the world — that is, the number of people who cannot meet their most basic needs for food, shelter and other absolute necessities. It is also useful for monitoring trends in poverty, including poverty in the middle-income countries, since it generally follows the same trends as higher poverty lines.

6. A large majority of the people in poverty are in Asia, with about 522 million in South Asia and 267 million in East Asia, including South-east Asia. The rate is highest, however, in sub-Saharan Africa, at about 48 per cent of the population. The percentages in other regions at the end of the 1990s were: 40 in South Asia, 15 in East Asia, and 12 in Latin America and the Caribbean.

7. In East Asia, the poverty rate declined from about 28 per cent in 1990 to 15 per cent in 1998, with the number of people in poverty declining from 418 million to 267 million. This dramatic reduction was due largely to rapid economic growth in the region, with per capita GDP growing at a rate of 6.6 per cent per year. Major reductions in poverty were achieved in China as well as in Malaysia, Thailand and Indonesia prior to the 1997-1998 economic crisis. That crisis led to substantial short-term increases in poverty, particularly in Indonesia, the Republic of Korea and Thailand. In Indonesia, the poverty rate almost doubled from 1996 to 1999 but appears to have declined again to its pre-crisis level. In the Republic of Korea, urban poverty more than doubled following the crisis but has subsequently declined again.

8. In South Asia, the proportion of people in poverty fell from 44 per cent in 1990 to 40 per cent in 1998, while the number of people in poverty increased from 474 million to 522 million. Per capita GDP grew in the 1990s at almost 4 per cent per year, but poverty reduction has been slow.

9. In sub-Saharan Africa, between 1990 and 1998, the poverty rate remained largely unchanged at about 48 per cent, and the number of people in poverty increased from 217 million to 291 million. Per capita incomes declined slightly over the 1990s, with lower commodity prices, civil conflicts and AIDS contributing to increases in poverty in many countries. Nonetheless, a few countries achieved significant reductions in the poverty rate. In Uganda, rapid economic growth in the 1990s, at almost 5 per cent per capita, reduced the poverty rate from 56 per cent to 44 per cent. In Côte d'Ivoire, Ghana and Mauritania, modest per capita economic growth, combined with reductions in inequality, led to significant reductions in the poverty rate.

10. In Latin America, the poverty rate declined from 17 per cent in 1990 to 12 per cent in 1998, while the number of people in poverty fell from 74 million to 61 million. In Brazil, poverty fell by 30 per cent in two years following economic stabilization in 1994. In Mexico, the poverty rate increased following the 1995 financial crisis. In Latin America, as in other regions, poverty often has a strong geographical component, with poverty concentrated in the rural highlands of the Andean countries and in the drought-prone north-east of Brazil.

11. In Eastern Europe and the former Soviet Union, there was a dramatic increase in poverty in the 1990s as GDP per capita declined and inequality increased. The number of people living on less than $1 a day increased from 1 million in 1987 to 7 million in 1990 and to 18 million in 1998, or about 4 per cent of the population. In the Russian Federation, between 1987 and 1998, real per capita GDP declined 41 per cent and inequality increased dramatically, leaving 19 per cent of the population with an income of less than $2 a day. In some Eastern European countries, economic growth resumed and poverty declined in the late 1990s.

III. Trends in inequality

12. Inequality in global income distribution has increased in recent decades, primarily due to the increasing gap between the richest and poorest countries. The ratio of average income of the richest 20 per cent of the world's population to average income of the poorest 20 per cent increased from 60:1 in 1991 to 78:1 in 1994. The poorest 20 per cent of the world's people receive only 1.1 per cent of world income, a decline from 1.4 per cent in 1991.[3]

13. Within countries, there is no clear overall trend in inequality. For the limited number of countries for which good data exist, between 1980 and the early 1990s, inequality appears to have declined in 24 countries and increased in 19 countries. However, the countries with increasing inequality include larger countries, so a majority of the world's population probably lives in countries with increasing inequality. Indonesia, the Republic of Korea and Malaysia achieved significant reductions in inequality together with rapid economic growth, with the two trends combining to produce large reductions in the poverty rate.

14. The new and improved survey data on inequality, covering more countries and with multiple surveys for many countries, do not support the old view that increasing inequality is a normal part of the early development process (the Kuznets hypothesis).[4] The new data show no general link between inequality and economic development. There are, however, significant regional patterns, with inequality generally being higher in Latin America and Africa, and lower in Asia and the developed countries. There is a growing view that more egalitarian societies tend to deal more effectively with economic, social and political shocks, sharing the burdens and adapting to changing situations. Furthermore, high or increasing inequality reduces the impact of economic growth on the reduction of poverty, thus requiring more economic growth to reduce the poverty rate by half, for example. High inequality in the distribution of productive assets, including land, capital, education and health, also limits development.

IV. Trends in other indicators of poverty

15. One of the international poverty-related targets, set at the World Food Summit in 1996, is the reduction by half of the number of hungry, or chronically undernourished, people in the world by 2015. Approximately 826 million people were thought to be chronically undernourished in 1996-1998, of which some 792 million lived in developing countries. While this is a significant reduction from the over 950 million undernourished in developing countries in 1969-1971, the projected number in 2015 is expected to be around 580 million, well over the target. To reduce hunger by half by 2015, a reduction of 20 million per year is needed, whereas, since the early 1990s, hunger has declined at a rate of less than 8 million per year. In sub-Saharan Africa, 34 per cent of the population were undernourished in 1996-1998.[5]

16. The average mortality rate for children under five years of age in the developing world fell from 135 (per 1,000 live births) in 1980 to 79 in 1998, compared to an OECD average of six. However, progress slowed in the 1990s and is below the rate required to meet the target of a two-thirds reduction between 1990 and 2015. Significant reductions were achieved in South Asia, to 89 per 1,000, in East Asia, to 43, in the Middle East and North Africa, to 55, and in Latin America and

the Caribbean to 37. Child mortality rates fell by three quarters in Sri Lanka, China, and Viet Nam, demonstrating what can be achieved. Child mortality rates remain high in sub-Saharan Africa, at over 150 per 1,000. In some countries in sub-Saharan Africa, infant and child mortality rates are rising, after years of decline.[6]

17. The international community has adopted the target of universal primary education by 2015. The proportion of primary school-age children in school has increased in all regions in the 1990s. In East Asia, primary education is now almost universal. The net primary school enrolment rate is about 94 per cent in Latin America and the Caribbean, 87 per cent in the Middle East and North Africa, and 77 per cent in South Asia.[7] In sub-Saharan Africa, however, net enrolment rates, at 60 per cent, have risen only slightly since 1980. In 12 countries in Africa, over half of primary school-age children are not in school.

18. Gender disparities in education have been reduced in all regions but remain substantial in South Asia and Africa. Globally, about 60 per cent of the children not in school are girls. The ratio of girls to boys in primary school is 82 per cent in South Asia and 84 per cent in sub-Saharan Africa, with lower ratios for secondary school.[8]

V. Poverty, natural resources and the environment

19. Poverty is generally concentrated in rural areas. While it is difficult to compare rural and urban poverty, it is estimated that about 75 per cent of the world's poor live in the rural areas of developing countries. In many developing countries, recent economic growth and poverty reduction have been concentrated in the cities, increasing economic differentials between urban and rural areas. Continuing urbanization is increasing the proportion of poor people who live in urban areas, but it is projected that 60 per cent of the world's poor will still be in rural areas in 2025.[9]

20. Rural and agricultural development has been particularly effective in reducing rural poverty, especially from 1975 to 1990. However, poverty reduction slowed in many countries in the 1990s as growth in agricultural productivity slowed and development policies and funding focused on export-oriented manufacturing, largely based in urban areas. The proportion of official development assistance (ODA) going to agriculture, which provides the livelihoods for most people in poverty, declined from 20 per cent in the late 1980s to about 12 per cent in 2000, and its absolute value fell by two thirds. The share of ODA going to low-income countries, where over 85 per cent of poor people live, has remained roughly constant, at around 63 per cent, and has been declining in real terms.[10]

21. Environmental degradation and resource depletion have a disproportionate impact on people in poverty, particularly in the rural areas of developing countries where subsistence and employment depend directly on natural resources. Degradation or depletion of soils, forest resources, water resources, pastures, wildlife and fisheries is aggravating poverty in many countries. Since the poor people in rural areas are often dependent on access to common sources for fuelwood, forage, water and other needs, the tendency to privatize common lands is also aggravating poverty. While people in poverty may be driven by need and by lack of ownership, knowledge and capital to use natural resources in unsustainable ways, most resource degradation occurs through overexploitation by the non-poor.

22. Experience in a number of regions in recent years has shown that community organizations involving people in poverty can, if given the authority, manage natural resources on a sustainable basis to support community development and poverty reduction. Collective, participatory resource management by local communities and user groups has been particularly effective in the conservation and management of water resources, forests and grazing lands, in some cases resulting in substantial improvements in sustainable yields.

VI. Challenges for the future

23. Meeting the poverty-related targets adopted by the international community in the 1990s will require both steady economic growth and specific efforts to meet economic and social needs. Since the population in poverty is dynamic, with some people escaping poverty each year while others fall into it as a result of unemployment, illness, violence, natural disaster or other misfortune, poverty reduction efforts must include policies and programmes that reduce social and economic vulnerability, especially of those near the

poverty line, through social safety nets and other support structures.

24. A large majority of the people in poverty will continue to live in the rural areas of developing countries for at least the next two decades. Increasing priority must therefore be given to rural and agricultural development, in a reversal of the declining priority it received in the 1990s. Major efforts will be needed to improve agricultural productivity and broaden access to land, credit, education, health care, water and sanitation. Poverty reduction will also require improvements in rural infrastructure, including markets, roads, transportation systems, communication, electricity and other modern energy sources, and institutions and incentives for saving and investment.

25. Rural people in poverty often live on marginal and degraded land, increasing their difficulty of escaping from poverty. Policies and programmes to combat poverty in such areas should therefore include agricultural research and extension work to develop and disseminate crops and techniques suitable for sustainable agriculture.

26. Community and other organizations representing people in poverty need to be included in policy-making for reducing poverty. Such organizations should be supported and strengthened in order to promote community development initiatives and to improve dialogue with government and other groups. In rural areas, community organizations including people in poverty should be involved in managing local water resources, forest resources and access to grazing land.

27. Another critical challenge will be addressing the particular needs of women and children in poverty. Women bear the greatest burdens of poverty and generally have more restricted opportunities for overcoming poverty. Promoting equal access for women to income-generating activities, land, water, credit and other resources is essential to poverty reduction. Income that is earned and controlled by women in poverty is more likely to be used to improve nutrition, health care, education and other basic needs than income earned or controlled by men. Ensuring access of all children to basic education and health care, and equal access for girls to education at all levels, is also critical. Because poverty is usually measured on a household basis, there is a lack of data on gender-specific poverty rates and trends. There is a need for better data to assess gender-specific poverty issues and to develop policies to address the problems.

Notes

[1] General Assembly resolution 55/2, para. 19.

[2] Data on trends in income poverty are based on the work of the World Bank, using an international poverty line of $1 per day per person (in constant 1985 United States dollars, at purchasing power parity). For the most recent data, see: www.worldbank.org/poverty/data/trends/index.htm. More detailed data and analysis are contained in the World Bank's *World Development Report 2000/2001*, available at: www.worldbank.org/poverty/wdrpoverty. Unless otherwise indicated, income data in the present report are from those sources.

[3] Thomas Vinod and others, *The Quality of Growth* (Washington, D.C., World Bank, 2000). See also *Poverty Trends and Voices of the Poor* (Washington, D.C., World Bank, 1999).

[4] Gary S. Fields, *Distribution and Development: A New Look at the Developing World* (Cambridge, MIT Press, 2001).

[5] *The State of Food Insecurity in the World* (Rome, FAO, 2000).

[6] *A Better World For All* (Washington, D.C., International Monetary Fund, 2000).

[7] *World Development Report 2000/2001* (Washington, D.C., World Bank, 2001), table 6.

[8] *The State of the World's Children 2001* (New York, UNICEF, 2001), table 7. See also www.unicef.org/sowc01.

[9] *Rural Poverty Report 2001* (Rome, International Fund for Agricultural Development, 2001), p. 15.

[10] *Rural Poverty Report 2001* ..., pp. 1-6.

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Health and sustainable development*

Report of the Secretary-General

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I. Introduction

1. Principle I of the Rio Declaration on Environment and Development states that "Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature".[1] The goals of sustainable development cannot be achieved when there is a high prevalence of debilitating illnesses, and population health cannot be maintained without ecologically sustainable development. This report examines progress achieved in selected areas related to chapter 6 of Agenda 21, highlights areas in which progress has been limited, and identifies issues and trends warranting future consideration. Health issues related to other aspects of sustainable development are also addressed in other reports.

II. Steady gains in global health

2. Over the past decade, average life expectancy has increased, infant and child mortality rates have declined, and the proportion of underweight and stunted children has decreased. In developing countries, the percentage of people with life expectancy at birth below 60 declined from 38 per cent to 19 per cent between 1990 and 1999. The proportion of people without access to improved water supply fell from 21 per cent to 18 per cent over the past decade. Many infectious diseases have receded, owing to improved sanitation, nutrition, drugs and vaccines.

3. Notable progress towards the eradication or elimination of various major infectious diseases has been made. For example, the annual incidence of polio has fallen from an estimated 350,000 cases in 1988 (the start of the Global Polio Eradication Initiative), to an estimated maximum of 20,000 in 1999. The number of polio-infected countries fell from 125 to 30 over that period; the remaining infected countries are concentrated in parts of sub-Saharan Africa and the Indian subcontinent — particularly in areas with low routine immunization coverage, poor sanitation or where conflict is prevalent. A marked acceleration of activities has been undertaken to meet the goal of global eradication of polio by 2005.

4. Success in the form of a 90 per cent (or higher) reduction in cases of guinea worm over the past decade was achieved owing to a strategy based on health education, case containment and provision of safe drinking water. Intensified efforts in leprosy control led to a drop in the prevalence rate from 3.9 per 10,000 in 1990 to 1.25 per 10,000 at the beginning of 2000. In West Africa, onchocerciasis (river blindness) has been virtually eliminated in 11 countries through a programme relying on vector control and community-based drug treatment, freeing millions of people from infection by the disease and releasing millions of hectares of riverine land for resettlement and cultivation.

5. Owing to the combined efforts of the World Health Organization (WHO), the United Nations Children's Fund (UNICEF) and other partners, immunization coverage for diphtheria, pertussis and tetanus (DPT), tuberculosis, measles and polio is currently 80 per cent or more in a majority of countries, as compared to approximately 30 per cent 20 years ago.

III. Gaps and constraints

6. Despite undoubted health advances in many areas, poor health continues to be a constraint on development efforts. In some cases the process of development itself is creating conditions where, as a result of economic, political and social upheaval, environmental degradation, and uneven development or increasing inequities, human health suffers. The facts below are illustrative.

7. More than 200 million people live today in countries with an average life expectancy of less than 45 years. Average life expectancy at birth in 1999 was 49.2 years in the least developed countries, compared to 61.4 for all developing countries and 75.2 for developed countries. In many sub-Saharan African countries, life expectancy fell during the 1990s owing to the impact of HIV/AIDS. Other major setbacks in health gains occurred in Eastern Europe and the former Soviet Union, where the political and economic transition has been accompanied by decreases in life expectancy of five years for males.

8. In some of the poorest countries of the world, one in five children still fails to reach his or her fifth birthday, mainly owing to infectious diseases related to the environment. The child mortality rate in the least developed countries in 1999 was 156 per 1,000 live

births, compared to 81 in all developing countries and 11 in developed countries.

9. More than 20 million women continue to experience ill health each year as a result of pregnancy. The lives of 8 million of those women are threatened by serious health problems, and about 500,000 women, almost 90 per cent of whom are in Africa and Asia, die as a result of causes related to pregnancy and childbirth. Around 17 per cent of potentially healthy years of life are lost in women of reproductive age because of sexually transmitted diseases, including HIV/AIDS.

10. Factors that hamper progress include inequalities in access to information and to health services, prevalence of high-risk sexual behaviour, and the low social status of women. WHO's Making Pregnancy Safer strategy will contribute to worldwide efforts to reduce maternal and perinatal mortality. Efforts are also being intensified to improve women's health in general, focusing, inter alia, on the health implications of harmful practices on the girl child and the promotion of women's health through functional literacy and economic activity.

11. Infectious and parasitic diseases (communicable diseases) account for 14 million deaths per year, around 25 per cent of the world total. They are the world's leading killers of children and young adults, including many breadwinners and parents. These diseases, which have intimate links to environmental conditions and poverty, affect the lives of poor people disproportionately and pose a serious threat to health and economic development.

12. Six major diseases currently cause 90 per cent of the deaths from communicable diseases: AIDS, malaria, tuberculosis, pneumonia, diarrhoeal diseases, and measles. In addition, several parasitic conditions continue to cause considerable morbidity and disability: schistosomiasis (over 200 million people infected), lymphatic filariasis (120 million people affected), trachoma (over 150 million infected), trypanosomiasis, or sleeping sickness (over 55 million people threatened), and Chagas disease (up to 18 million people infected in Latin America).

13. HIV/AIDS has reversed the rising life expectancies of the 1990s (sometimes to pre-1980 levels) in some countries. It is the fastest growing health threat to development today and a potential risk to security. About 36 million adults and children are now living with HIV/AIDS, 95 per cent of them in developing countries. In sub-Saharan Africa, over 25 million people are infected with HIV/AIDS. More than 12 million Africans have died of AIDS (over 2 million in a single year), and 13.2 million have been orphaned, due to HIV/AIDS.

14. High (or rising) HIV infection rates are also occurring in many other parts of the world. For example, in Asia, where more than 6 million people are living with HIV/AIDS, there is the potential for an explosive epidemic. Factors driving the global epidemic are complex but include gender inequality, high-risk sexual behaviour, unsafe blood supplies, drug injection and other factors. Strengthened multisectoral responses and the implementation within health systems of better targeted, low-cost prevention and care strategies are among the numerous interventions being developed worldwide at all levels.

15. Several hundred million people continue to be infected annually with malaria, which results in almost 300 million clinical cases worldwide each year, and over 1 million deaths. The scale of the problem is increasing in many countries, partly because of deterioration in public health infrastructure, climatic and environmental changes, conflict-related human migration, widespread poverty and the emergence of drug-resistant parasites. Malaria has slowed economic growth in endemic countries in Africa by up to 1.3 per cent per year. WHO's Roll-back Malaria campaign hopes to have a significant impact on the disease in the coming decade.

16. Despite considerable progress in tuberculosis control in the 1990s, about 8 million people develop active tuberculosis every year, and the disease kills over 1.5 million people per year. In many cases, countries with the highest burdens have, for political or socio-economic reasons, been slow to adopt or expand control strategies, such as those advocated by the Global Partnership to Stop TB. Control efforts are also hampered by the emergence of HIV/AIDS and drug resistance.

17. More than 4 million people die each year from acute respiratory infections, which are the top killers of children under five years and which accounted in 1999 for 7.2 per cent of total deaths at all ages. Pneumonia, the deadliest of such diseases, kills more children than any other infectious disease, with 99 per cent of those deaths occurring in developing countries. Many deaths

could be prevented by the use of low-cost antibiotics and improved access to primary health care. Associated risk factors include low birthweight, malnutrition, crowding, and indoor air pollution due to cooking and heating with dirty biomass fuels and coal. Two billion people or more in developing countries, mostly women and girls, are exposed to indoor air pollution due to lack of access to modern energy carriers, resulting in over 1.5 million excess deaths each year.

18. Today, more than 1 billion people are without access to improved water supply, and 2.4 billion lack access to improved sanitation. Diarrhoeal diseases, largely preventable through access to safe drinking water, sanitation and food hygiene, claim 1.5 million lives a year among children under five years and account for several billion diarrhoeal episodes each year. Many of those deaths could be avoided by the use of simple and cheap oral rehydration salts. Cholera is a recurring problem in many areas and has become endemic in others. Exemplifying this trend, the number of reported cases worldwide nearly doubled in 1998, as compared to 1997.

19. In addition to preventive actions in environmental health, efforts to improve the health of young children under the age of five have been strengthened by the strategy of integrated management of childhood illness. Nevertheless, more than 2 million children under five continue to die each year from diseases that can be prevented by currently available vaccines; approximately 800,000 of those deaths are from measles alone. Neonatal tetanus has been eliminated in over 100 countries; nevertheless it continues to kill almost 300,000 newborns and 40,000 mothers each year. Almost 30 million children of the 130 million born every year lack access to routine immunization services. Where mass vaccination efforts have been successful — for example, in the Americas — over 90 per cent of children are now immunized.

20. Nearly 30 per cent of the world's population suffer from one or more of the multiple forms of malnutrition. Deficiencies of iodine, vitamin-A, iron and folic acid remain important and preventable contributors to morbidity and mortality. Almost 50 per cent of the 10 million deaths among children under five each year in the developing world are associated with underweight malnutrition. At the same time, obesity is becoming an increasingly important risk factor globally in adolescents and adults.

21. In 1999, non-communicable diseases were estimated to have contributed to almost 60 per cent of deaths (33.5 million) in the world, (cardiovascular disease 30.3 per cent, cancer 12.6 per cent, respiratory diseases 6.4 per cent), and 43 per cent of the global disease burden. Non-communicable diseases and injuries are strongly associated with the aggressive marketing of unhealthy diets, tobacco and alcohol and with reduced physical activity.

22. Tobacco remains a major preventable cause of premature death and disease. One in two smokers dies prematurely as a result of the habit. In 1999, there were over 1.25 billion smokers in the world, representing one third of the world's population aged 15 and over, the vast majority of whom are in developing countries. Four million people died in 2000 from over 25 tobacco-related causes of death, including several cancers and heart and respiratory diseases. A survey conducted in 12 countries throughout the world found that 10-33 per cent of 13-15-year-olds in those countries use tobacco. This portends a lifetime of addiction and premature death for many.

23. Injuries and violence (including domestic violence against women and children) are major neglected public health problems and lead to more than 5 million deaths a year. Injuries currently represent 14 per cent of the global burden of disease. Many injuries also result in lifelong disabilities, affecting up to 10 per cent of the population. Road traffic injuries in particular, are an important cause of unintentional injuries in developed and developing countries alike. In all countries, the use of seatbelts, better alcohol control and general road traffic safety would considerably reduce mortality and morbidity. Three of the 10 leading causes of death for 15-44-year-olds in developing countries are injury-related: road traffic injuries, interpersonal violence, and suicide. Three million adolescents between the ages of 10 and 25 lose their lives each year, mostly to traffic injuries, suicide and homicide.

24. Mental and neurological disorders affect 400 million people. Thirty per cent of countries do not have access to the basic drugs needed to treat such conditions as schizophrenia, depression and epilepsy.

25. Over 1 million workers die each year because of work-related diseases and injuries, and about 250 million accidents and 160 million cases of work-related diseases occur globally each year. The burden is

heavier on workers (including children) in the informal sector, which is the largest and least protected sector. The economic costs of occupational injury, diseases and death have been estimated at 4 per cent of global GNP.

IV. Future trends and challenges

26. At the dawn of the new millennium, poverty is likely to remain the number one killer worldwide. Poverty is an important reason that babies are not vaccinated, clean water and sanitation are not provided, drugs and other treatments are unavailable, and mothers die in childbirth. A disproportionate burden of disease will continue to be borne by disadvantaged or marginalized women, especially those living in environmentally degraded or ecologically vulnerable areas, in zones of conflict or violence, or compelled to migrate for economic or other reasons. The feminization of poverty is a major threat to social and economic development.

27. Many health problems will continue to be exacerbated by pollution, noise, crowding, inadequate water and sanitation, improper waste disposal, chemical contamination, poisonings and physical hazards associated with the growth of densely populated cities. Badly managed urban settlements and overcrowded housing make it easier for infectious diseases to spread and for illicit drugs and violence to take hold. Urban growth has outstripped the capacity of many municipal and local governments to provide even basic health services.

28. Urban growth also means greater dependence on transport systems, which, if automobile-based, generate further pollution and risk of injuries. Air pollution, both ambient and indoor, including the work environment, will continue to be a major contributor to respiratory and other ill-health conditions and of particular concern to the health of children (asthma and acute respiratory infections, for example), women and the elderly (chronic respiratory illness). Already more than 1 billion people in urban areas are exposed to health-threatening levels of air pollution, and the figure is expected to increase.

29. The globalization of trade, travel and culture is likely to have both positive and negative impacts on health. Increased trade in services and products harmful to health and the environment, travel and mass migration of people constitute additional global threats to health. Communicable diseases (such as tuberculosis), for example, are increasingly spreading to developed nations, where they affect the most vulnerable and poorest people.

30. There is increasing concern about food safety, related both to chemical substances and microorganisms. In many parts of the world, a rising incidence of food-borne disease has been evident over the past decade. In addition, the direct and indirect health consequences of the application of biotechnology in food production is a matter of concern. While the growing trade in food brings benefits (in terms of ensuring safe and nutritious diets), it could also contribute to an increased dissemination of food-borne disease. The promotion of international food safety standards and guidelines is likely to promote health and trade in both developed and developing countries. Data from the United States of America and Europe indicate that specific interventions directed at particular microorganisms, such as salmonella, can reduce the incidence of food-borne disease. WHO and the Food and Agriculture Organization of the United Nations (FAO) are working together to improve surveillance, monitoring and risk assessment methodologies.

31. Global environmental threats to health include climate change, depletion of the ozone layer, reduction of biodiversity, degradation of ecosystems and the spread of persistent organic pollutants. The long-term health consequences of human-induced climate change are likely to be profound and include threats to the food supply, natural disasters, infectious diseases, sea-level rise, changes in precipitation patterns and increased frequencies of extreme climate events, which may impinge particularly upon some of the least developed countries. Planning for the protection of human health from the potential impacts of global environmental threats requires a much improved understanding of the disease-inducing mechanisms involved and of the vulnerability of populations.

32. Disasters, both human-induced and natural, offset years of development and are foremost causes of poverty and renewed vulnerability. Currently around 250,000 people are killed every year as a result of natural disasters, with about 95 per cent of the deaths occurring in developing countries, reflecting the differences in disaster mitigation and preparedness levels between developed and developing countries.

Population displacement, increases in populations living in vulnerable areas, transportation of toxic and hazardous materials, rapid industrialisation, water and food scarcity, and chronic conflict increasingly lead to complex humanitarian emergencies, including the collapse of public health services. The International Strategy for Disaster Reduction provides an important framework in which WHO and its partners will continue to contribute to international efforts aimed at disaster prevention and mitigation.

33. The steep projected increase in the burden of non-communicable diseases worldwide represents one of the major challenges to future health development. Non-communicable diseases, injuries and violence will account for nearly 80 per cent of the global burden of disease in 2020. By then, the leading causes of disability are likely to be heart disease, depression and road traffic injuries. By 2030, at current projections, tobacco will kill more than 10 million people annually, with 70 per cent of the deaths occurring in developing countries and about half in productive middle age. The number of women smokers is expected to triple over the next generation.

34. The number of people over the age of 65 is likely to reach 10 per cent of the global population by 2025, and increases of up to 300 per cent in the older population are expected in some developing countries. The portion of the global disease burden attributable to mental and neurological disorders and substance abuse is expected to rise significantly. Health systems will need to be reoriented to deal with chronic diseases requiring long-term care, which endanger the financial sustainability of health care systems in general.

35. Health has become a more central concern in development, both as a contributor to, and an indicator of, sustainable development. While health is a value in its own right, it is also key to productivity. Many of the ill-health conditions described above have significant impacts on economic growth and development. For the first time, meetings of the Security Council, the G-8, the World Economic Forum and the Organisation for Economic Cooperation and Development, and the follow-up to major international conferences such as the World Summit for Social Development, have explicitly addressed health issues that require attention as development or security issues.

36. The health sector itself is changing. For example, some health systems are more oriented to the needs of poor people, give greater attention to promoting health throughout the lifespan, redress inequities in health status, show heightened concern for quality, measure performance and are attempting to close the gap in research capacity between developed and developing countries.

37. Many of the key determinants of health and disease — as well as the solutions — lie outside the direct control of the health sector, in sectors concerned with environment, water and sanitation, agriculture, education, employment, urban and rural livelihoods, trade, tourism, energy and housing. Addressing the underlying determinants of health is key to ensuring ecologically sustainable development and sustained health improvements in the long term. Much progress has been made in forging closer links between health and other sectors, particularly through local and national intersectoral health and development plans and through increased use of planning tools such as health impact assessment procedures, integrated monitoring and surveillance systems and improved health information systems and indicators.

Notes

[1] *Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992* (United Nations publication, Sales No. E.93.I.8), resolution 1, annex I.

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Education and public awareness for sustainable development*

Report of the Secretary-General

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* The report was prepared by the United Nations Educational, Scientific and Cultural Organization as task manager for chapter 36 of Agenda 21, with contributions from other United Nations agencies and international organizations. The report is a brief factual overview, which is intended to inform the Commission on Sustainable Development on key developments in the subject area.

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I. Introduction

1. Agenda 21 recognizes education in all its forms (including public awareness and training) as an essential means for achieving progress towards sustainable development and for the implementation of all chapters of the Agenda. Education is no longer seen as an end in itself but rather as a key instrument for bringing about the changes in knowledge, values, behaviour and lifestyles required to achieve sustainability. Moreover, education is considered a fundamental human right. Article 26 of the Universal Declaration of Human Rights states that "everyone has the right to education".

2. The importance given to education and public awareness in Agenda 21 and the other outcomes of the United Nations Conference on Environment and Development was reinforced by the agreements and resolutions adopted at all the other major conferences organized by the United Nations in the 1990s. It should be noted that the goal to enrol all children in primary school is among the seven goals for international development that the United Nations, the World Bank Group, the International Monetary Fund and the Organisation for Economic Cooperation and Development are using as a common framework to guide their policies and programmes and to assess the effectiveness of their organizations.[1]

3. The present report reviews accomplishments and constraints in promoting education and public awareness for sustainable development and presents issues for further consideration.

II. Education for all: the foundation

4. The World Conference on Education for All (Jomtien, Thailand, 5-9 March 1990) marked a renewed start in the global quest to make basic education universal and eradicate illiteracy. The Jomtien Conference also marked the beginning of a broader vision of basic education, one that encompasses all forms of organized education and training which meet the basic learning needs of individuals, including literacy and numeracy as well as the general knowledge, skills, values and attitudes that they require to survive, develop their capacities, live and work in dignity, improve the quality of their lives, make informed decisions and continue learning. Recognizing the essential role of the "Education for All" (EFA) goals and targets for achieving progress in sustainable development, chapter 36 of Agenda 21 encouraged all countries to endorse the recommendations of the Jomtien Conference and to implement its Framework for Action to Meet Basic Learning Needs.

5. At Jomtien, commitments were made and directions set for a decade of large-scale and sustained efforts. Six "target dimensions" were agreed upon, and countries were invited to set their own specific targets within those areas. Agreements were entered into by countries, intergovernmental organizations, and non-governmental organizations to work together throughout the decade. The EFA Forum, consisting of the United Nations Educational, Scientific and Cultural Organization (UNESCO), the United Nations Development Programme (UNDP), the United Nations Children's Fund (UNICEF), the World Bank and later the United Nations Population Fund (UNFPA), was established to guide and coordinate the work, to monitor progress and to assess achievements.

6. Ten years after the Jomtien Conference, the EFA 2000 Assessment was undertaken, the most in-depth evaluation ever of basic education. The current status of basic education in more than 180 countries was examined through national assessments, sample surveys, case studies, a series of 14 thematic studies, and data from participating countries on 18 statistical indicators that quantify progress towards the goal of EFA.

Box 1

Jomtien Framework for Action: six target dimensions

1. Expansion of early childhood care and developmental activities.

2. Universal access to, and completion of, primary school, or of whatever level of education is considered "basic", by the year 2000.

3. Improvement of learning such that an agreed percentage of an age cohort attains or surpasses a defined level of achievement.

4. Reduction of the adult illiteracy rate to one half its 1990 level by the year 2000, with sufficient emphasis on female literacy to reduce significantly the current disparity between male and female literacy rates.

5. Expansion of the provision of basic education and training in other essential skills required by youth and adults, with programme effectiveness assessed in terms of behavioural change and impact on health, employment and productivity.

6. Increased acquisition by individuals and families of the knowledge, skills and values required for better living and sound and sustainable development, made available through all education channels, including the mass media, other forms of modern and traditional communication, and social action, with effectiveness assessed in terms of behavioural change.

Note: The Jomtien Framework for Action invited countries to set their own targets with reference to these dimensions; it was not assumed that all the numerical targets could be met within a decade.

Source: International Consultative Forum on Education for All, *Education for All 2000 Assessment: Global Synthesis* (Paris, UNESCO, 2000).

7. The EFA 2000 Assessment revealed that none of the specific EFA targets set at Jomtien had been met in its entirety, even the fundamental goal of achieving "universal access to, and completion of" basic education by 2000. There is, however, general consensus about several major gains made in the course of the decade. There is broad agreement on five major issues requiring further attention in a very large number of countries and action by the international community: access and equity; quality, relevance and effectiveness; sharing responsibility; mobilizing resources; towards a new knowledge base.

8. The major findings of the EFA 2000 Assessment[2] were as follows:

(a) The number of children enrolled in school rose from an estimated 599 million in 1990 to 681 million in 1998, nearly doubling the average increase during

the preceding decade. Eastern Asia and the Pacific and Latin America and the Caribbean are now close to achieving universal primary education. China and India have also made substantial progress towards that goal. Developing countries as a whole have achieved a net enrolment ratio in primary education in excess of 80 per cent;

(b) Understanding of the importance of the early years is now firmly placed on the global agenda, and the idea that education begins at birth has taken root in many societies. As a result, the number of children in pre-school education rose by 5 per cent over the past decade;

(c) More people are now entering secondary education, and the rate at which populations complete upper secondary education is rising steeply with each successive age group. Enrolment in secondary education worldwide expanded 10-fold over the past 50 years, from 40 million in 1950 to more than 400 million today. Over the same period, enrolments in tertiary education increased nearly 14-fold, from 6.5 million in 1950 to 88.2 million in 1997;

(d) The number of children not enrolled in school decreased from an estimated 127 million in 1990 to 113 million in 1998;

(e) The number of literate adults grew significantly over the past decade, from an estimated 2.7 billion in 1990 to 3.3 billion in 1998. The overall global adult literacy rate now stands at 85 per cent for men and 74 per cent for women. More than 50 per cent of the world's adult population has now attended primary school. But adult illiteracy remains a major problem. An estimated 880 million adults cannot read or write, and in the least developed countries one out of two individuals falls into this category. Two thirds of illiterate adults are women — exactly the same proportion as 10 years ago;

(f) A few countries have made progress in reducing disparities in the distribution of educational opportunity, as reflected by gender, disability, ethnicity, urban versus rural location and working children. Nevertheless, positive trends in primary education mask disparity of access both between and within many countries, and disparities in educational quality can remain even when access rates are high. People in poor, rural and remote communities, ethnic minorities, and indigenous populations have shown little or no progress over the past decade. And the gender gap persists;

(g) Many countries continue to be constrained by the availability of resources and the efficiency of the systems that exist to allocate them. Today, an estimated 63 per cent of the education costs worldwide are met by Governments. But the private sector is becoming increasingly more important and accounts on average for 35 per cent of education funding. The last 2 per cent comes from overseas aid programmes. Between 1990 and 1997 aid to education from bilateral sources fell from $3.64 billion to $3.55 billion in cash terms. Over the same period, the contribution to educational development from the World Bank dropped by nearly 40 per cent, from $1,487 million to $880 million. Average levels of spending on education worldwide have hovered around 5 per cent of GNP for more developed countries and 4 per cent for less developed countries in the period between 1980 and 1997.

9. The World Education Forum, held in Dakar, Senegal, in April 2000, to review progress 10 years after Jomtien approved the Dakar Framework for Action which

confirms the World Declaration on Education for All, approved at Jomtien.[3] The Dakar Framework represents a collective commitment to achieve education for all by 2015, according to six goals set for the future (see box 2) and at an estimated annual cost of $8 billion. A commitment was made that no country with strong political will and a serious EFA plan should be thwarted in the achievement of the goals because of lack of resources. Making clear the link with sustainable development, the Framework states that education is "the key to sustainable development and peace and stability within and among countries, and thus an indispensable means for effective participation in the societies and economies of the twenty-first century".

Box 2
Dakar Framework for Action: six goals for the future

1. Expand and improve comprehensive early childhood care and education.

2. Ensure that by 2015 all children have access to and complete free and compulsory primary education of good quality.

3. Ensure that the learning needs of all young people are met through equitable access to appropriate learning and life skills programmes.

4. Achieve a 50-per-cent improvement in levels of adult literacy by 2015, especially for women, and equitable access to basic and continuing education for adults.

5. Eliminate gender disparities in primary and secondary education by 2005 and achieve gender equality by 2015.

6. Improve all aspects of the quality of education and ensure excellence of all.

Source: UNESCO, *The Dakar Framework for Action. Education for All: Meeting Our Collective Commitments* (Paris, UNESCO, 2000).

III. Beyond basic education to education for sustainable development

10. While chapter 36 of Agenda 21 is grounded in the fundamental challenges and requirements of education for all, it sees education as embracing all of the ways in which people learn about the world around them, develop values and lifestyles that reflect an understanding of global realities, and assume their responsibilities as global citizens to prepare for the future. The concerns of chapter 36 therefore are relevant for people of all ages and in all countries. After the United Nations Conference on Environment and Development, that broad scope posed a problem. In 1996 the Commission on Sustainable Development initiated a special work programme on education which was instrumental in establishing priorities and focusing efforts.

11. Since then, much progress has been made in advancing the new vision of education, public awareness and training as key instruments for achieving sustainable development. This has been a fundamental achievement in that an entire conceptual framework had to be created. However, there still remains considerable confusion about the concept. Of particular concern is the continuing misconception that sustainable development is mostly about the environment and that "education for sustainable development" is therefore simply a new twist to the notion of "environmental education".

12. The implications of the new vision of education for sustainable development for formal educational systems are major, and they coincide with a broad rethinking in many countries, where formal educational systems are no longer considered adequate to meeting the needs of society and the workplace. Traditionally, education was designed to pass on existing knowledge, skills and values. The new vision reorients it in terms of how to prepare people for life — for job security; for the demands of a rapidly changing society; for technological changes that affect every part of life; and, ultimately, for the quest for happiness, well-being and quality of life. Education is being redefined as a lifelong process that needs to be not merely readjusted but also restructured and reformed.

13. Since the United Nations Conference on Environment and Development, there has been increasing recognition that a curriculum oriented towards sustainability would place good citizenship among its primary objectives. Many existing curricula are being revised with that objective in mind. Efforts are being made to develop teaching, learning and assessment processes that emphasize values, ethical motivation and the ability to work with others to help build a sustainable future. Increased attention is being given to the humanities and social sciences. For the most part, what has been achieved is relatively isolated, serving to indicate in which direction curriculum reform needs to move.

14. Reorienting the curriculum towards sustainable development means that at least two major structural reforms must be undertaken. One is to re-examine the centralized mandating of courses and textbooks, to allow for locally relevant learning programmes. The other is to develop new ways to assess the processes and outcomes of learning. Some efforts along these lines have been attempted, but for the time being, change at a significant scale is still lacking.

15. There are approximately 60 million teachers in the world, each a potential agent of change in support of sustainable development. Therefore, teacher education has become a priority within chapter 36. Major initiatives include:

(a) Developing international guidelines for reorienting teacher education;

(b) Establishing an international network of some 50 teacher education institutions, each of which is conducting a project to reorient all or part of its pre-service curriculum according to the directions laid down in chapter 36;

(c) Developing a multimedia teacher education programme, entitled Teaching and Learning for a Sustainable Future.[4] A pilot version of this programme has been published, consisting of 25 modules, totalling about 100 hours of professional development for both pre-service and in-service teachers.

16. Since the United Nations Conference on Environment and Development, many higher education institutions, organizations, governmental agencies and individuals

worldwide have made significant efforts to incorporate sustainable development into academic programmes, operations and community outreach. Two areas of university life have emerged as particularly crucial for sustainable development: the area of lifelong learning, in which the productive sector often draws closer to the university, and the management of the university, where the capacity to foster changes in attitudes and procedures is highest. Progress has been made in introducing an interdisciplinary approach into teaching and research. Major research projects, such as that on climate change, support working across disciplines. However, the frontiers between academic disciplines remain staunchly defended by professional bodies, career structures and criteria for promotion and advancement. Some progress has been made in including appropriate materials on sustainable development in the programmes of study of journalists, engineers, managers, doctors, lawyers, scientists, economists, administrators and numerous other professionals, and in special programmes for teachers, senior managers, local politicians and leaders. Partnering and networking have improved, for example, through such bodies as University Leaders for a Sustainable Future, International Association of Universities, and UNESCO.

17. Since the United Nations Conference on Environment and Development, there has been increasing recognition of the critical role of education in promoting sustainable consumption and production patterns in order to change the attitudes and behaviour of people as consumers and producers and as citizens carrying out their collective responsibilities and duties. But this field is still in its infancy. Some progress has been made through activities with the advertising industry, youth surveys and in the development of teacher education materials.[5]

18. Education is chronically under-financed. An undetermined — but insufficient — amount of money has been invested since the Conference in supporting the specific sustainable development components of education falling within the purview of chapter 36. In addition to increasing amounts of funding, there is need for greater clarity, coordination and — where possible and appropriate — cohesion of funding for education at the national level, from all sources and for all aspects of development.

19. Non-formal education (including public awareness) is presented in chapter 36 as a key instrument. Formal educational systems are notoriously slow to change. Non-formal channels are capable of delivering new information and tapping new approaches and methods for teaching and learning more easily. In professional educational circles, it is the promise of the non-formal sector which is being seen increasingly as a complement to formal education for the future, making the role of non-governmental organizations and associations of all kinds, as well as the media and the arts, ever more important. A great deal of work is also being done with respect to public awareness in support of the articles concerning education in each of the environmental conventions, such as the Global Biodiversity Initiative.

20. The role and importance of major groups in implementing chapter 36 has increased significantly since the Conference. The UNESCO NGO Liaison Committee, representing about 350 professional non-governmental organizations in the field of education, has set up a special commission to mobilize its members in support of the World Summit on Sustainable Development. The education and youth caucuses of the Commission on Sustainable Development have attempted to work with all the other caucuses to make education a cross-cutting theme. The CONGO

Committee on Sustainable Development and the newly formed Committee on Education are also engaged in supporting education for sustainable development.

21. Since the Conference, there have been numerous regional initiatives on education for sustainable development. The Multinational Project on Education for Citizenship and Sustainability in Multi-cultural Societies is sponsored by the Organization of American States and UNESCO in the context of the follow-up to the second Summit of the Americas (1998) and the subsequent meeting of Ministers of Education of the Americas (1998). The European Commission organized a Conference on Environmental Education and Training in Europe (1999), which was instrumental in creating new networks within the European Union. Canada organized the Planet ERE Conference for 50 Francophone countries (1996). France is organizing Planet ERE 2 in Paris in November 2001. These last two major efforts have played an important role in galvanizing action and new partnerships in the countries in question. The meeting on education for sustainable consumption, organized by the Organisation for Economic Cooperation and Development (OECD), played an important role in defining that aspect of chapter 36.

IV. Issues for further consideration

22. Reorienting educational systems is an undertaking which will bear fruit only in the long term. Non-formal education, including public awareness, may deliver results in a shorter time-frame. Both are essential for preparing a sustainable future. Within this vast challenge, certain issues should receive particular attention.

23. In formal education, efforts should focus in the future on:

(a) Promoting education for all as a fundamental human right and in meeting the international targets that have been set;

(b) Reforming secondary and higher education, in terms of both curricula and teaching methods;

(c) Reorienting teacher education in order to improve the quality of education.

24. With regard to non-formal education (including public awareness), priority should be given to:

(a) Developing education for sustainable consumption;

(b) Promoting greater and more targeted action by the educational community, non-governmental organizations, youth and other major groups at national and community levels.

25. It would also be opportune to explore further the linkages between the various relevant international action plans and legal instruments as they relate to education and public awareness, especially at the national level, taking into account not only United Nations conferences but also more specialized international conferences organized by the United Nations system. Efforts could be made to:

(a) Avoid dispersion of efforts or overlap among the various frameworks for action;

(b) Improve coordination of the United Nations system at the national level;

(c) Ensure that education and public awareness are integral parts of national sustainable development strategies and other relevant national development plans;

(d) Fully involve major groups and the educational community.

Notes

[1] International Monetary Fund, Organisation for Economic Cooperation and Development, United Nations, World Bank Group, *2000 - A Better World For All* (Washington, D.C. and London, 2000).

[2] See International Consultative Forum on Education for All, *Education for All 2000 Assessment: Global Synthesis* (Paris, UNESCO, 2000); UNESCO, Institute for Statistics, *Facts and Figures, 2000* (Paris, UNESCO, 2000).

[3] For information about the World Education Forum and its preparation, consult http://www.unesco.org/education.

[4] Version 1 was published in March 2001 by UNESCO on its web site (www.unesco.org/education/tlsf/) and as an Internet CD-ROM. Version 2 will be published in late 2001, free of charge in several languages, after extensive evaluation by non-governmental organizations and networks representing teachers and teacher-training institutions.

[5] One module in the UNESCO multimedia programme Teaching and Learning for a Sustainable Future concerns sustainable consumption.

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Changing consumption patterns*

Report of the Secretary-General

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* The present report was prepared by the Department of Economic and Social Affairs of the United Nations Secretariat as task manager for chapter 4 of Agenda 21, with contributions from other United Nations agencies and international organizations. The report is a brief factual overview, which intends to inform the Commission on Sustainable Development on the key developments in the subject area.

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Introduction

1. Agenda 21[1] notes that the major cause of the continued deterioration of the global environment is the unsustainable pattern of consumption and production, particularly in industrialized countries. It further notes that while consumption is very high in certain parts of the world, the basic consumer needs of a large section of humanity are not being met. Changing consumption patterns towards sustainable development will require a multi-pronged strategy focusing on meeting basic needs and improving the quality of life, while reorienting consumer demand towards sustainably produced goods and services.

2. The issue of changing consumption patterns is thus very wide-ranging. The present report will focus on broad patterns of consumer demand as they relate to sustainable development and efforts that are being made to change those patterns to ensure sustainability.

I. Trends in consumption

3. The world is now in the midst of a multidimensional process of globalization. People, goods, services, information and money are moving around the globe more rapidly and in larger volumes. World trade in goods and services increased over 60 per cent in the last decade, reaching almost $6.7 trillion in 1998, while foreign direct investment (FDI) increased more than four-fold to $865 billion.[2] Per capita consumption increased as real gross domestic product (GDP) grew at 2.9 per cent per year while population grew at 1.4 per cent per year.

4. A closer look at economic trends, however, shows large disparities between and within regions. As noted in the 1998 *Human Development Report*,[3] 20 per cent of the world's population, in the high-income countries, account for 86 per cent of total private consumption expenditures, while the poorest 20 per cent, in low-income countries, consume a mere 1.3 per cent. Consumption per capita has increased steadily in industrialized countries at about 2.3 per cent per year over the past 25 years, very rapidly in East Asia at about 6.1 per cent, and at a rising rate in South Asia at around 2.0 per cent. On the other hand, the consumption expenditure of the average African household is 20 per cent less than it was 25 years ago. The lack of adequate consumption by the poorer segment of the world population is a critical concern for sustainable development and is considered further in the report of the Secretary-General on combating poverty.

5. More efficient use of energy is critical to sustainable consumption. Average per capita world commercial energy consumption amounted to 1,692 kilograms of oil equivalent (kgoe) in 1997.[4] People in the Organisation for Economic Cooperation and Development (OECD) countries continued to consume much more energy than those in developing countries, an average of 6,400 kgoe per capita in 1999: this was 10 times the consumption in developing regions, which was about 620 kgoe per capita.[5] In North America, per capita annual gasoline consumption for motor vehicles amounted to 1,637 litres per person in 1997, compared with 427 litres per person in Western Europe, 50 litres per person in Asia (excluding West Asia) and a mere 31 litres per person in sub-Saharan Africa. Per capita energy consumption for the world as a whole did not change significantly during the period 1990-1997. High growth in East Asia and the Pacific and moderate growth in West Asia, South Asia and North Africa were offset by a substantial decline in Eastern and Central Europe. In the industrialized countries, per capita energy consumption showed moderate annual growth during this period from their already high levels.[6] For much of the developing world, fuelwood and charcoal remain the primary source of energy, while industrial bioenergy use is growing in some developed countries, including Sweden, Finland, Austria, France and Italy.[7]

6. On the natural resource front, over the past century, mainly as a result of agricultural expansion to meet the growing demand for food and other agricultural products, about half of the world's wetlands area has been lost and grasslands have been reduced by more than 90 per cent in some areas.[8] The world's forested area has declined from 11.4 square kilometres (km^2) per person in 1970 to only 7.3 km^2 per person at present.[9] In addition, nearly 70 per cent of the world's major fish stocks are overfished or are being fished at their biological limit to meeting growing demand for fish and fish products. Soil degradation has afflicted two thirds of the world's agricultural lands as farming practices have intensified to meet increasing demand for food, with particularly high growth in demand for meat and dairy products. Dams and other water diversions to meet growing

demand for water, especially for agriculture, fragment almost 60 per cent of the world's large rivers. As a result of unsustainable development and degradation of freshwater ecosystems, 20 per cent of the world's freshwater species are extinct, threatened or endangered.

7. Looking at material flows, industrial economies have become more efficient in their use of materials, but overall waste generation has continued to increase.[10] A study of five industrialized countries for the period 1975-1996 showed that although resource consumption declined on a per capita and per unit GDP basis, overall resource consumption and waste flows into the environment continued to grow owing to economic and population growth. One half to three quarters of annual resource inputs to industrial economies were returned to the environment as wastes within a year. Improvements in resource efficiency and waste reduction have been limited by continuing use of older-generation technologies and by consumer lifestyles focusing on mobility, convenience and product disposability.

8. Efforts to change consumption patterns have used a variety of instruments, including process standards, product standards, environmental taxes, reduction of environmentally harmful subsidies, consumer information, eco-labels, and others. More recently, efforts have been made to combine such instruments into integrated product policies addressing all phases of the product life-cycle, including design, production, consumption and disposal. This approach has been driven by the recognition that environmental impacts of products in the consumption and disposal phase can often be addressed most effectively by interventions that influence the design phase. It also recognizes that sustainable consumption and production, taking into account economic, environmental and social issues, require cooperation among a variety of actors in all phases of product production and consumption.

9. In general, despite improvements in efficiency, environmental pressures continue to increase owing to the continuing increase in the volume of goods and services consumed and discarded as a result of increasing income and consumer demand. Reducing the environmental pressures from consumption will require a broader policy framework that addresses the scale pressures of current patterns while encouraging efficiency improvements.[11]

II. Impacts of changes in consumption patterns in developed countries on developing countries

10. Owing to increased consumer awareness and concern for sustainable development, including health, social development and the state of the environment, particularly in developed countries, efforts to change consumption patterns are expanding. The market for environmentally friendly products in OECD countries has grown since the 1980s, although recent empirical evidence suggests that consumers' expressed preferences often are not translated into real purchasing decisions.[12] Consumer organizations and other non-governmental organizations are increasingly taking environmental and social considerations into account in their efforts to assist consumers in making informed choices. Middle- and upper-class consumers in developing countries, in particular young people, are displaying similar patterns of consumption and increasing levels of awareness of the impacts of their consumer choices.[13]

11. The actual and latent preference among consumers in developed and developing countries for sustainably produced products, together with the growing markets for some products, provide both challenges and opportunities for developing countries. Certification for eco-labels and environmental and social standards present challenges. However, many producers in developing countries have taken this trend as an opportunity to explore new export markets. For example, the rapidly growing interest in, and willingness to pay for, organic products have been an incentive for producers both in developing and in developed countries to introduce organic farming practices. The "Fair Trade" movement, which assures consumers in developed countries that the developing-country products they purchase were produced under good social conditions, has increasingly integrated environmental concerns.

12. Consumer and public pressure for sustainable production is leading an increasing number of multinational corporations to adopt uniform standards for all of their global operations and those of their suppliers. This supply-chain pressure is leading to the adoption of cleaner production methods and improved working conditions in companies in developing countries producing for export markets. In order to ensure adequate supplies to meet the growing demand

for sustainably produced products, multinational corporations are often assisting their developing country affiliates and suppliers in meeting the standards of developed-country markets. A growing number of companies in developing countries are obtaining certification of environmental management systems under the ISO 14000 criteria of the International Organization for Standardization (ISO), with a view to meeting the evolving consumer demand in developed-country markets. In addition, growing stakeholder involvement has encouraged corporate policies of social responsibility and corporate reporting on environmental and social issues. The Global Reporting Initiative is an international multi-stakeholder effort to create a common framework for voluntary reporting of economic, environmental and social dimensions of organization-level activities, products and services.[14]

III. Globalization and sustainable consumption

13. An important driving force for changing consumption and production patterns in the world today is globalization. Through globalization, consumers now have more choices of goods and services. Increased trade, FDI and technology transfer are resulting in global dissemination of cleaner production methods that conserve resources and reduce environmental impacts. However, globalization also poses some environmental threats through, for example, increased consumption of natural resources and generation of waste. Increased transport of goods and personal travel result in higher levels of carbon dioxide (CO_2) emissions. Globalization can also result in the spread of unsustainable lifestyles. Current policies and production patterns are insufficient to address the increased stress on the environment owing to increased production and consumption. There is also concern that global competition is undermining social and environmental policies, although this is a matter of intense debate.

14. Globalization is, in some cases, exacerbating the effects of weak environmental policies. For example, demand from the world market for food and other agricultural products may promote excessive use of agro-chemicals, resulting in soil degradation, or encourage unsustainable fishing in the absence of proper fisheries management regimes.[15] High demand and high prices on world markets can increase pressure for unsustainable harvesting of tropical timber. In addition, alien invasive species that accompany goods and transportation can cause significant damage to ecosystems, as in the case of the zebra mussel in the North American Great Lakes.

15. Information technology has accelerated the movements of goods, information and people around the globe and increased the variety of services available to consumers throughout the world. Internet-based "e-commerce" is growing rapidly, for both retail sales and business-to-business transactions. Total transactions through e-commerce were estimated at $127 billion in 1999 and are projected to increase to $1.4 trillion in the United States alone by 2003.[16] While information technology has the potential to reduce material consumption, there is no empirical evidence of such an effect to date, mainly owing to the fact that consumer habits have not changed. For example, electronic mail and improved communications have not reduced the volume of conventional mail or the number of people travelling; and there has resulted a continued rapid increase in the demand for transport, with its accompanying environmental impacts. In some instances, improved technology has even increased energy and material consumption. Global paper consumption is expected to grow by about 50 per cent by 2010, with the largest increase in developing countries, as a result of both increased literacy and expanding use of information and communication technologies.[17]

16. The Internet has also greatly improved networking, exchange of information and coordination of activities among non-governmental organizations concerned with sustainable development, including consumer and environmental organizations. These new capabilities have supported the increased activism of non-governmental organizations in relation to business, Governments and intergovernmental organizations on issues relating to globalization, environmental protection, poverty, debt relief and other development issues.

IV. Issues for further consideration

17. While resource productivity is increasing on a per capita and per unit GDP basis, overall resource consumption and waste continue to grow, as increases in consumption and production outpace the

improvements in eco-efficiency and the changes in consumption patterns. A broader policy framework is required to address the scale pressures of current patterns, while encouraging efficiency improvements and promoting improvements in standards of living, particularly in developing countries.

18. Globalization and the new information and communication technologies provide opportunities to shift to more sustainable consumption and production patterns, but this will not happen automatically. Policies and programmes need to be developed to ensure that the new technologies help shift consumption and production patterns to improve standards of living while reducing resource consumption and environmental damage.

Notes

[1] *Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992*, vol. I, *Resolutions Adopted by the Conference* (United Nations publication, Sales No. E.93.I.8 and corrigendum), resolution 1, annex II.

[2] World Bank, *World Development Indicators 2000* (Washington, D.C., 2000) tables 4.5 and 4.7, and *World Investment Report 2000: Cross-border Mergers and Acquisitions and Development* (United Nations publication, Sales No. E.00.II.D.20), table I.1.

[3] New York, Oxford University Press, 1998, overview, p. 2.

[4] World Bank, *World Development Report 2000/2001: Attacking Poverty* (New York, Oxford University Press, 2001), table 10 of Selected World Development Indicators.

[5] Report of the Secretary-General entitled "Energy and sustainable development: options and strategies for action on key issues" (E/CN.17/ESD/2001/2).

[6] *World Development Report 2000/2001*, table 10 of Selected World Development Indicators.

[7] Food and Agriculture Organization of the United Nations (FAO) "Wood energy situation and trends", contribution for the World Energy Conference 1998.

[8] United Nations Development Programme (UNDP), United Nations Environment Programme (UNEP), World Bank and World Resources Institute, *World Resources 2000-2001: People and Ecosystems, the Fraying Web of Life* (Oxford, Elsevier, 2000).

[9] UNEP, *Global Environment Outlook 2000* (New York, 1999).

[10] E. Matthews and others, *The Weight of Nations: Material Outflows from Industrial Economies* (Washington, D.C., World Resources Institute, 2000).

[11] "Consumption patterns", in *OECD Environmental Outlook* (OECD, Paris, forthcoming in 2001).

[12] Elaine Geyer-Allely and Adriana Zacarias-Farah, "Information and consumer decision-making: background paper for the OECD Workshop on Information and Consumer Decision-Making for Sustainable Consumption", OECD Environment Directorate, forthcoming (2001).

[13] UNEP/Division of Technology, Industry and Economics (DTIE), Global Consumers Class Study, "An international study on consumer trends and expectations", *Industry and Environment*, October-December 2000 issue, and UNEP/United Nations Educational, Scientific and Cultural Organization (UNESCO), "Is the future yours", research project, Paris, January 2001.

[14] Global Reporting Initiative, Sustainability Reporting Guidelines on Economic, Environmental and Social Performance, 2000.

[15] Hakan Nordstrom and Scott Vaughan, Trade and Environment, Special Studies 4 (Geneva, World Trade Organization, 1999).

[16] "Booming economies, silencing environments and the paths to our future: background note by the Commission for Environmental Cooperation on Critical and Emerging Environmental Trends", note by the Secretariat, Commission for Environmental Cooperation, 2000.

[17] UNEP/DTIE, "Consumption facts and figures", *Industry and Environment*, vol. 22, No. 4 (1999).

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Progress in preparatory activities for the World Summit on Sustainable Development at the local, national, subregional, regional and international levels, as well as by major groups

Sustainable human settlements development and environmentally sound management of solid wastes**

Report of the Secretary-General

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** The present report was prepared by the United Nations Centre for Human Settlements as task manager for chapters 7 and 21 of Agenda 21, with contributions from other United Nations bodies and international organizations. The report is a brief factual overview designed to inform the Commission of key developments in the subject area.

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I. Introduction

1. Current conditions of human settlements worldwide, as documented in the third *Global Report on Human Settlements* currently being finalized for presentation at the five-year review of the United Nations Conference on Human Settlements (Habitat II), are a cause of great concern. Despite the continued efforts of Governments and their partners, widespread urban poverty remains and the living environment has not been significantly improved in most countries. The development of sustainable human settlements, as called for in chapter 7 of Agenda 21 and reconfirmed in the Habitat Agenda, remains a challenge to all stakeholders, including women, in all countries. Meeting the challenge requires policy responses that are based on the principles of partnership, participation and decentralization. Further, it goes without saying that the human settlements dimensions of overall sustainable development should encompass both rural and urban areas.

2. Increasing rates of solid waste production in both developed and developing countries have created serious constraint to the improvement of environmental and health conditions of human settlements. Environmentally sound management of solid wastes needs to be addressed in local and national strategies aimed at promoting sustainable human settlements development.

3. The present report reviews accomplishments and constraints in both areas. To the extent possible, it establishes the links between sustainable human settlements development and environmentally sound management of solid wastes.

II. Promoting sustainable human settlements development

4. Some achievements have been made at the international, regional, national and local levels to mainstream the principles of partnership, participation and decentralization and to identify good practices in their implementation in an integrated manner. Strides forward have been made in terms of a growing legitimization of citizens' groups, grass-roots organizations and civic leaders, particularly at the local level. Partnership has been established at the international, national and local levels between the private sector, Governments, local authorities and other actors of civil society. Decentralization has made significant steps forward since the United Nations Conference on Environment and Development (UNCED). Following the Fourth World Conference on Women, gender responsiveness has become increasingly recognized as a particularly relevant issue in relation to participation, urban governance and decision-making, as well as to the issue of equal access to land, property and inheritance rights.

5. A number of international urban environment programmes, such as the "Localizing Agenda 21" programme of the United Nations Centre for Human Settlements (Habitat) and the joint Habitat/United Nations Environment Programme (UNEP) "Sustainable cities programme" promote and support such environment-development principles, broad participatory and system-wide cross-sectoral processes in major city demonstration projects, inter-agency cooperation, and national replication programmes. The "Local Agenda 21 programme" of the International Council for Local Environmental Initiatives (ICLEI) is another example specializing in increasing the awareness, commitment and contribution of local authorities to sustainable human settlements development and global environmental management. ICLEI's cooperation helps to prevent duplication, to achieve economies of scale, to promote learning from each other's experiences, and to disseminate lessons learned to as wide as possible an audience, such as through ICLEI participation in the UEF.

6. Among the obstacles to the promotion of sustainable human settlements development are a lack of implementation of partnerships, insufficiency in creating a level playing field whereby the interests and aspirations of politically weak members of society can truly influence decision-making processes and legislative reform, and the gap between the transfer of responsibilities and the devolution of powers, resources and revenue-generation mechanisms.

7. Central to the development of sustainable human settlements remains the mobilization of sufficient human and financial resources to enhance the capacities and improve the conditions for promoting the transfer of good practice, supporting central-local government partnership in policy-making, translating good policy into effective and sustainable local action, and enhancing the opportunities of the poor, the excluded and the marginalized to fully participate in

and benefit from the implementation of Agenda 21 and the Habitat Agenda.

A. Improved urban management

8. Significant progress has been made in various countries and cities to devise mechanisms to implement good urban governance. This progress can be categorized in three broad strategies, namely, to promote decentralization and strengthen local authorities; to encourage participation and civic engagement; and to ensure transparent, accountable and efficient governance of cities.

9. Constitutional reforms that provide periodic elections, independent parliament and devolution of power and responsibilities to local governments have facilitated decentralization and strengthened local authorities. Systems of laws and budgeting procedures have been developed to support local authorities in undertaking new responsibilities. Such systems have also facilitated the widening of the tax base for the local authorities. Several excellent capacity-building programmes have been initiated to help local governments become more effective, responsive and accountable to their citizens.

10. Governments at various levels have undertaken interventions that facilitate effective stakeholder consultation processes and strengthen political, administrative and financial interventions at the local level. Through pressure on city governments, the significant development of citizens' organizations has demanded greater participation in governance and has highlighted the need for greater equity in the definition of investment priorities.

11. Issues of good governance have been addressed in collaboration between public and private bodies at various levels, including public-private partnerships, contractual procedures and co-funding mechanisms. In this context, specific measures have been implemented to enhance transparency and accountability in local authorities, including transparent tendering procedures, independent audit reports, measures to reduce corruption, provisions for regular disclosure of assets of public officials and elected representatives, public feedback mechanisms, such as report cards, publication of documentation on the entire planning and participation process in both large and small-scale projects, and open and free debates on urban and good governance issues in the media. United Nations bodies are actively supporting improved urban governance, such as the United Nations Development Programme (UNDP) through its Bureau for Development Policy and Habitat through its Global Campaign for Good Urban Governance.

B. Improved infrastructure and services

12. Although commendable efforts have been undertaken to increase the coverage of infrastructure and services, the overall number of people without access to basic services is still increasing. Many development assistance agencies and the private sector have started working directly with communities and small-scale independent service providers. Their efforts have been complemented by programmes aimed at building partnerships between local authorities and service providers and communities. Local Agenda 21 S, sustainable cities demonstrations or similar arrangements helped in creating the necessary framework conditions for such partnerships, including mobilization of resources, allocation of responsibilities, accountability of participating stakeholders and establishing mechanisms for sharing of risks and benefits.

13. In many countries, the infrastructure sector has undergone sector reforms to attract urgently required capital. Innovative financing mechanisms, in addition to the usual funds from multilateral and bilateral agencies, target investments directly from the private sector to commercialized utilities and service providers. In this context, new partnerships between the private sector and communities have evolved and proven fruitful.

14. Strategies for conservation and demand management are considered an important tool for local authorities to better manage infrastructure and services. In the first instance, service providers develop long-term strategies to assess and manage the demand for services within the framework of nature conservation as well as action plans to address consumer demands. These strategies and plans allow local authorities to increase efficiency and equity in service provision and mobilize resources. In the water sector, for example, catchment management agencies have been established, which have the mandate to coordinate all actors at the national, provincial and local levels affecting water resources of cities.

C. Shelter for all

15. The concentration of poverty, homelessness and slums is increasingly associated with the growth of the world's urban populations. This urban growth is mostly informal and unplanned, often resulting in people settling on unwanted and dangerous locations. In the last 10 years, it has become all too apparent that conditions for the world poor have continued to deteriorate.

16. Informal settlements exist and expand because of the inadequate provision of land, speculative investments patterns, a tendency towards over-regulation, and a regulatory framework of standards, regulations and administrative procedures that is at best indifferent and more often hostile to the needs of the urban poor.

17. The issue of tenure security is recognized as central both in rural and urban areas. One key to sustainable rural development is legally secure access to assets by the rural poor and the landless. A likely result of insecure tenure in the accelerating urbanization processes is that the rural poor will become the urban poor, where the same issues of tenure insecurity prevail. The extension of tenure security is a key element of any integrated approach to improving the access of the urban poor, not only to shelter and other basic social services but also to employment opportunities and direct political representation.

18. In promoting the "Shelter for all" objective, the Global Campaign for Secure Tenure initiative, spearheaded by Habitat, aims to help create conditions for improved access to shelter for the world's poor, particularly in developing countries and countries with economies in transition. Central to the Campaign initiative is a policy framework which recognizes the importance of engaging the world's poor as active developmental partners. The Global Campaign for Secure Tenure initiative is linked to the Global Campaign on Urban Governance, aimed at improving local governance systems.

III. Environmentally sound management of solid wastes for sustainable human settlements

A. Minimizing wastes

19. Waste production rates in both developed and developing countries are increasing at unprecedented rates. What used to be a modest task for municipalities has now become a major environmental problem. The waste produced by a city is directly related to its relative wealth. Low-density wastes contain large amounts of packaging, plastics and paper produced by affluent societies. High-density wastes with a high moisture content are produced by less affluent societies. Different types of waste require different treatment/disposal options.

20. The proportion of hazardous waste from households/small industries/medical clinics has increased. There is little control and a number of specific wastes are discharged uncontrolled into the environment. Most local authorities/private contractors are not set up to deal with such dispersed forms of waste production.

21. Municipal authorities often spend between 20 and 30 per cent of their budget on cleaning and waste disposal. The vast majority of this expenditure, around 70 per cent, is related to transportation costs. The cost increases are further exacerbated by poor collection efficiency due to poor vehicle routing and planning and inadequate maintenance.

22. Increasing land prices and availability in or around the urban centres make waste disposal increasingly difficult and costly. Finding a suitable site that offers an economically sound disposal option is becoming increasingly difficult.

B. Promoting environmentally sound waste disposal, treatment and recycling

23. In many countries, waste disposal still leaves a lot to be desired. Dumping is uncontrolled and hazardous waste is disposed of with non-hazardous at the same dump sites. This poses a significant hazard not only for waste management workers but also for those who live close to disposal facilities or derive their income from such sources. Many cities are currently close to a crisis

situation with regard to the environmental and health costs related to solid waste management. In fact, some cities have already experienced epidemics that have resulted in significant economic losses from reduced tourism and export potential. The urban poor are the hardest hit in relation to their direct living environment. In developing countries, where a large proportion of the urban poor are involved in waste collection and recycling as a means of income generation, there are severe health hazards associated with scavenging of wastes, particularly among children. There are also significant proportions of vector-borne diseases (such as Dengue fever) whose prevalence can be traced to poor solid waste disposal.

24. Residential waste storage facilities are often inadequate. Containers are not designed to effectively contain putriscible wastes in tropical climates, where waste collection efficiency is poor. In many municipalities, collection efficiency may be less than 30 per cent of waste produced. Landfills gases, such as methane and carbon dioxide produced by the decomposition of waste, contribute significantly to greenhouse gas emissions. Incineration of waste has to be done in a controlled manner if it is not to be hazardous to the environment. Many incinerators are not operated at optimum temperature to ensure breakdown of hazardous waste to harmless by-products.

25. A large proportion of city waste is organic, as much as 70 per cent in developing regions. Not only is this a resource which should be reclaimed but to use valuable and scarce landfill space is unsustainable. In addition, organic waste disposed to landfill greatly increases greenhouse gas emission. In cities where its reuse in agriculture is a possibility, composting and reuse is a sensible option.

26. Technological advances in recycling have been made in the developed world with increased use of reduced materials, such as the improved quality of recycled paper. However, goods made from raw materials are often preferred to those made from recycled materials, especially in situations where quality of the final product is important.

C. Extending waste service coverage

27. Waste production, unlike many other services or commodities, is difficult to measure, and therefore charges associated with collection volumes and disposal costs are difficult to calculate. Local authorities in particular need more reliable data on production to enable them to charge users for how much they produce and the true cost of disposal. Certain hazardous wastes are expensive to treat in specialized processes. Reliable data on production will also enable waste management services to be streamlined.

28. With the increasing trend towards privatization of services and the drive for increased efficiency, there is an increasing need for legislative frameworks which enable satisfactory regulation of solid waste collection and disposal. The small-scale private waste management sector is often forgotten but can play a key role in an overall city waste management strategy. Privatization contracts and legislation should be flexible enough to permit the participation of small-scale service providers, particularly in the lower-income areas of cities.

29. Despite many examples of good practice from around the world, inappropriate technologies, particularly for solid waste collection, are still common. Collection vehicles are often not suited to extremes in climate or the condition of the roads, which often results in a large proportion of local authority vehicles being out of use. Local technologies should, wherever possible, be adapted or imported technologies redesigned with more appropriate specifications. Also, there is a severe lack of operation and maintenance of solid waste handling equipment. In many local authorities, maintenance is more a question of responding to day-to-day crisis rather than of a preventative nature.

IV. Issues for further consideration

30. The enormous concentration of extreme poverty in the cities raises some difficult policy issues that will need to be addressed within a rights-based approach to development, with special concern for equity among men and women. This approach integrates human rights into the overall development framework, with special concern, for example, for the need to remove social and legal discrimination against women, as is the case with inheritance rights. It relates to the need for improved provision and availability of urban land that is affordable and well located for self-help development.

31. Given the increasingly recognized synergy between rural and urban areas, there is a need to design policy responses which address a need for a balanced urban network, recognizing the links between large cities, small and medium-sized towns and their hinterlands. Sound systems of human settlements are essential for marketing agricultural products and for creating added value from primary inputs. In the end, such systems are critical for the promotion of economic growth, the creation of employment and the eradication of both rural and urban poverty.

32. A challenge in the rapidly increasing infrastructure sector is for countries to put in place effective governance systems and administrative mechanisms to ensure the provision of services in an efficient and equitable manner. A number of international agencies are assisting Governments through capacity-building programmes in this regard.

33. There is an urgent need to raise awareness of the need for effective solid waste management and of its contribution to sustainable human settlements. Specific attention needs to be paid to waste minimization. An efficient solid waste management service should comprise the appropriate combination of public, private and community-level actors, based on the cities needs. Capacity at the city level should focus on the development of simple management information systems, which allow the waste management sectors to optimize the use of service providers.

34. In developing countries, more promotion is needed of informal sector waste recycling. Small-scale waste recycling initiatives provide much-needed income for the urban poor. There are isolated good practices in many cities around the world; they are simply not recognized or replicated.

35. Sharing of information and data on environmentally sound management of solid wastes should be promoted. In monitoring, evaluating and distributing such information and data, the development and use of sustainability indicators would be important.

36. Tighter control of inadequate land disposal requires demonstration of good practices in landfill taxes and other such economic instruments, which can help local authorities to keep tighter control of environmental standards. Solid waste management equipment producers and suppliers need an appropriate forum to ensure production of equipment which is suited to the various differing needs of cities and local authorities around the world. Information on good practices from the informal waste sector in many countries should be factored into the overall solid waste management strategy for particular cities.

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Finance and trade*

Report of the Secretary-General

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* The present report was prepared by the United Nations Conference on Trade and Development as task manager for chapter 2 of Agenda 21 and the Department of Economic and Social Affairs of the United Nations Secretariat as task manager for chapter 33 of Agenda 21, with contributions from other United Nations agencies and international organizations. The report is a brief factual overview, which intends to inform the Commission on Sustainable Development on key developments in the subject area.

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Introduction

1. The present report addresses the thematic cluster of finance and trade for sustainable development and reviews the progress achieved in the implementation of the objectives for trade, as set out in chapter 2 of Agenda 21,[1] and for finance, as set out in chapter 33 of Agenda 21. Both issues were addressed most recently by the Commission on Sustainable Development in 2000 at its eighth session. Section I addresses issues relating to finance and reviews general trends in finance for sustainable development. Section II addresses issues relating to trade and sustainable development, focusing on efforts to integrate trade policies and environmental policies, particularly within the context of the World Trade Organization and the United Nations Conference on Trade and Development (UNCTAD), where trade-environment linkages have been a major issue during the 1990s.

I. Finance

A. International finance for sustainable development

1. Official development assistance

2. Between 1992 and 1997, total official development assistance (ODA) from the Organisation for Economic Cooperation and Development (OECD) Development Assistance Committee (DAC) member countries to developing countries and multilateral institutions fell steadily from 0.33 per cent of donor country gross national product (GNP) to 0.22 per cent, far below the United Nations target level of 0.7 per cent of GNP. In 1998, there was a slight reversal of this trend, with ODA increasing to 0.23 per cent of GNP for 1998 and 0.24 per cent for 1999.[2] Part of this increase is expected to be transitory, but part reflects a commitment by some donor countries to increasing their aid flows.

3. There have also been changes in the allocation of ODA. During the 1990s, some assessments of aid effectiveness concluded that aid was effective in some national policy environments, but not in others. As a result, there have been sharp cuts in ODA to some countries, but only modest cuts to others whose policies were considered by donors to be more conducive to aid effectiveness. Some countries experienced cuts of at least 50 per cent in aid per capita between 1990 and 1998.[3]

4. In addition to the changes in allocation among countries, there have also been changes in the sectoral allocation of ODA, in particular to critical areas of sustainable development. The shares of ODA allocated to environmental protection and basic social services approximately doubled from 1990 to 1998 for both bilateral and multilateral ODA, with a consistent rising trend over the period. Nonetheless, in 1998 the combined share for those two categories was under 12 per cent of total bilateral commitments and below 8 per cent of multilateral commitments.[4]

2. Private international financial flows

5. In the area of private international financial flows, there have been rapid increases in foreign direct investment (FDI) over the past 10 years. Global FDI outflows reached $800 billion in 1999, an almost fourfold increase from the 1988-1993 average.[5] The number of transnational parent firms in 15 developed home countries increased from about 7,000 at the end of the 1960s to some 40,000 at the end of the 1990s, and the gross product associated with international production by transnational corporations is now about 10 per cent of global gross domestic product (GDP), up from about 5 per cent in 1982.[6]

6. The globalization of investment and production is in part a result of changes in national policy frameworks. According to the United Nations Conference on Trade and Development (UNCTAD), during the period 1991-1999, of 1,035 changes worldwide in laws governing FDI, 94 per cent created a more favourable framework for FDI.[7] Most of the new measures in developing and transition economies reduced restrictions on foreign investment in sectors or industries earlier closed or restricted with respect to FDI. Restrictions on land ownership, employment of foreigners, and foreign exchange controls were also reduced or removed. There have also been large increases in bilateral investment treaties and double taxation treaties over the period from 1980 to 1999.

7. For some developing countries, particularly middle-income countries, private financial flows are the largest source of external finance for sustainable development. Net FDI flows to developing countries had grown steadily through the 1990s to reach $126 billion in 1999, up from about $20 billion in 1990.[8]

FDI flows, however, remained highly concentrated. Ten developing countries received 80 per cent of total FDI flows to the developing world, and there is no indication that that concentration is declining.[9] However, in many of the least developed countries, even though FDI flows are small compared with those to other countries, they are still important in relation to domestic investment.

8. While FDI flows to developing countries have grown steadily, portfolio investment flows and bank flows have shown great volatility. Net portfolio investment in developing countries reached a peak of $90 billion in 1994 and then fell to almost nothing in 1998 before recovering somewhat in 1999.[10] Other private flows to developing countries, primarily bank lending, have fluctuated from net inflows of about $70 billion in 1991, to net outflows of $36 billion in 1994, inflows of $80 billion in 1995 and outflows of $77 billion in 1999.[11]

3. External debt

9. Unsustainable external debt has increasingly been recognized as a constraint on the ability of poor countries to pursue sustainable development. In response, in 1996, the World Bank and the International Monetary Fund (IMF) launched the Heavily Indebted Poor Countries (HIPC) Initiative, endorsed by 180 Governments. In 1999, the Enhanced HIPC Initiative was adopted to provide debt relief that would be "broader, deeper and faster". As of end-December 2000, of the 37 HIPC countries identified as having unsustainable debt, 22 countries had been approved for debt relief under the Enhanced HIPC Initiative, 13 were classified as post-2000 decision point countries and 2, at government request, were not seeking debt relief.[12]

10. Challenges faced by the Enhanced HIPC Initiative include ensuring the principle of additionality of resources for the HIPC programme; overcoming the financial difficulties for some creditor participants in providing debt relief; and developing effective poverty reduction programmes in the participating countries. Debt relief under the Initiative is linked to recipient countries' preparation of a comprehensive poverty reduction strategy, based on rapid, sustainable growth and improvements in social services.

B. Domestic finance for sustainable development

11. Financing sustainable development requires the mobilization of domestic investment, even in countries able to attract substantial external private investment. During the 1990s, in order to promote both domestic and foreign investment, many developing countries undertook fiscal and monetary reform. They lifted controls on interest rates, reduced Government-directed credit, developed new instruments for long-term investment financing, and built more effective regulatory and supervisory structures for the financial sector.

12. There is increasing experience in both developed and developing countries with environmental taxes and charges, which generate revenues, improve resource productivity and confer environmental benefits. However, the fact that their implementation requires strong institutions in the financial and environmental sectors represents a major barrier to their use in many developing countries. Revenue from environmental taxes is still low in most countries. However, the use of environmental taxes has increased in some States members of the European Union (EU).[13] Data from 21 OECD member countries show that revenues from environmentally related taxes ranged between 1.0 and 4.5 per cent of GDP in 1995.[14]

13. Subsidies, of which a large majority promote unsustainable development, are estimated at over $600 billion per year worldwide, and may be as much as $800 billion, of which perhaps two thirds are in the developed countries.[15] Reducing subsidies that promote unsustainable development can both reduce environmental harm and free substantial resources for investment. Subsidies in many developing countries and economies in transition have been reduced during the past decade, usually as part of a liberalization process. However, subsidy reduction is complex politically, as it inevitably means that some groups, often politically influential, will suffer economic losses.

14. The private sector has the potential to play a greater role in financing for sustainable development. However, there is still limited understanding of the best ways to mobilize that potential under various economic, political and social conditions. Privatization is increasingly being used to finance infrastructure provision and the experience with private provision of

previously public sector services has generally been good with respect to the economic dimension of sustainable development. Evidence on the environmental and social impacts is less clear.

C. New financial mechanisms

15. Agenda 21 challenged the international community to find substantial new funding to help countries — particularly the least developed — to pursue sustainable development. The past 10 years have witnessed the development of innovative instruments for sector finance, especially for infrastructure such as power, water, sanitation and public transport. Financial markets have evolved in a complementary way by developing innovative financing instruments, including public-private partnerships, new forms of credit guarantees, subnational financing without sovereign guarantees, new microfinancing mechanisms for the informal and rural sectors, and joint ventures. In addition, the Clean Development Mechanism (article 12) of the Kyoto Protocol (FCCC/CP/1997/7/Add.1, decision 1/CP.3), annex to the United Nations Framework Convention on Climate Change (A/AC.237/18 (Part II)/Add.1 and Corr.1, annex I) may be an important source of finance for sustainable development, but the mechanisms still need to be elaborated.

16. The Global Environment Facility (GEF) has been an important source of new funding. The GEF was transformed from a pilot facility in 1991 into a global partnership with 167 countries as members. It has over 806 projects that stretch across more than 150 developing nations and countries with economies in transition. Nearly $3.2 billion has been allocated to these initiatives, matched by almost $8 billion more in co-financing. The GEF is the designated "financial mechanism" of the Convention on Biological Diversity[16] and the United Nations Framework Convention on Climate Change. The GEF was also identified, in December 2000, as the principal entity for the interim financial mechanism of the draft Stockholm convention on persistent organic pollutants.

17. The GEF contributing participants have twice replenished the GEF Trust Fund. In 1994, 34 donors pledged $2 billion over four years for a restructured GEF as called for in Agenda 21. In 1998, 36 donors pledged $2.75 billion to fund GEF's work into the new millennium. The GEF has initiated negotiations for its third replenishment which are expected to be completed in February 2002. GEF also leverages funds from other sources and mainstreams action on the global environment into the programmes of other international institutions, Governments and the private sector.

D. International Conference on Financing for Development

18. In December 1999, at its fifty-fourth session, the General Assembly decided to convene a high-level international intergovernmental event on financing for development.[17] On 23 February 2001, the Preparatory Committee for the High-level International Intergovernmental Event on Financing for Development, at its second substantive session, recommended to the Assembly the adoption of a draft resolution in which the Assembly would decide that the event would be called the International Conference on Financing for Development and would be hosted by Mexico.

19. The Conference is scheduled to take place in early 2002 and will consider national, international and systemic issues relating to financing for development in a holistic manner in the context of globalization and interdependence. The Conference will address development through the perspective of finance, as well as the mobilization of financial resources for the full implementation of the outcome of the major United Nations conferences and summits of the 1990s. An analytical assessment of the issues to be addressed at the Conference is given in the report of the Secretary-General to the Preparatory Committee for the High-level International Intergovernmental Event on Financing for Development.[18]

II. Trade

A. Trade and trade-offs

20. International trade has increased dramatically since the United Nations Conference on Environment and Development. Although the developed countries are still the main world traders, the share of developing countries in total world trade has reached 30 per cent. Trade among developing countries has also been on the rise, with more than 40 per cent of their exports being

sold to each other. The advent of the "new economy" has increased dramatically the tradability of goods and services. Many international transactions, which previously would have been considered prohibitively expensive, have now become commonplace because of the ease with which people can travel and communicate electronically across national boundaries.

21. These developments, however, need to be kept in perspective. A large share of trade flows has been intraregional and intra-firm. Efforts by developing countries to become full participants in an increasingly interdependent global economy have been hindered by biases in the trading system. Developing-country exporters have struggled to gain access to the markets of the developed countries. The continuing decline of commodity prices — and the terms of trade — represented a major challenge, particularly to the least developed countries. The extreme price movements previously suffered by commodity producers have started to affect manufacturers as well.

22. The past decade has brought a great expansion of multilateral, regional and unilateral trade liberalization. Liberalization under the General Agreement on Tariffs and Trade (GATT) and the World Trade Organization has led to significant tariff reductions as well as stronger and more comprehensive trade rules. However, high tariffs have persisted in some sectors of particular importance to exporters in developing countries.[19] Higher tariffs on processed products than on raw materials have also remained an issue for a number of raw material-based products, making it difficult for developing countries to enter into industrial exports. Despite multiple efforts at reform, many of the poorest developing countries have not been able to share in the benefits of the liberalization process. The majority of least developed countries have failed to achieve economic growth and to integrate into global markets.

23. International economic integration through trade has had important environmental implications. Increasingly, market forces have rewarded good environmental performance rather than cost savings at any price. In large part, this phenomenon has been due to the efforts of businesses and civil society around the world that have made consumers sensitive to the environmental profile of products and the environmental performance of producers. Growing consumer preference for environmentally friendly products (EFPs) has offered new trading opportunities for developing countries. Indeed, a number of developing countries have expanded exports of EFPs as well as "fair trade" products.

24. Available data seem to reject the assertion that polluting industries have been migrating from developed to developing countries, although there have been exceptions.[20] The main vehicles of trade — transnational corporations — have generally preferred reaping the economies of scale of standardization in environmental management systems in their foreign affiliates rather than exploiting weaknesses in local legislation.[21] The largest transnational corporations have increasingly been committing themselves to voluntary principles and standards of corporate social responsibility, tapping on their large, and largely unexplored, potential to contribute to sustainable development.

B. Policies and politics

25. Environmental policies and institutions, including supporting regulatory instruments, have been important determinants of the environmental impacts of trade. Certain progress has been made in promoting environmental impact assessment procedures at the national level and indirect policies such as land-use policies, taxes and other financial incentives, and government procurement. However, policies directly affecting trade and the environment, for example, those on technology transfer, financial assistance and capacity-building, have been lagging behind.

26. In certain cases, the integration of markets has also led to the "integration" of market failures, including those relating to public goods. The continuing dismantling of economic borders has reinforced the need for cooperation in environmental matters, especially those with transboundary or global implications. Managing the interactions between trade and the environment has been one of the areas where Governments have tried to develop new forms of international cooperation to correct market failures and deal with other distortions arising from domestic policies.[22]

27. Even before — and certainly after — the United Nations Conference on Environment and Development, trade policy decisions have been influenced by environmental interests. However, there has been little progress on the trade and environment agenda. Some

particularly in developing countries, viewed environmental issues primarily as a concern of the developed countries, yet very few developed countries have taken consistent action to integrate environmental protection into trade policies. Developing countries have expressed fears that environmental issues might be used to create new barriers to trade and thwart hard-won gains in market access, effectively turning environmental protection into trade protectionism.

28. Part of the problem in integrating environmental and trade policies was that some people regarded environmental measures as ends in themselves, rather than as an essential component of sustainable development. Environmental protection and economic development were often viewed as separate issues, and those who argued for environmental causes failed to address the urgent need to generate wealth to provide for the essential needs of poor people, particularly in developing countries, and vice versa.

29. Attempts to establish a link between environmental issues and labour standards in the trade policy debate have complicated efforts to address either issue. These attempts were made, in part, because the two issues re-emerged in the trade policy agenda at about the same time in the 1990s, and also, in part, because those primarily interested in trade liberalization tended to view both environment and labour as equally extraneous to what they considered the central issues. This attitude, based largely on trade concerns, overlooked important differences between the two issues in terms of their actual and potential cross-border impacts as well as the principles involved.

30. The starting point for the United Nations Conference on Environment and Development-related debate on trade and environment was a series of contentious trade disputes.[23] The GATT/World Trade Organization dispute settlement procedure was viewed by the environmental communities in some countries as a threat to environmental policy-making and, in particular, to the use of trade measures to support environmental objectives. On the other hand, some proponents of trade liberalization were concerned that the use of trade measures for "extraterritorial" environmental objectives could undermine the multilateral trading system and its economic benefits.

31. The growing public anti-trade sentiment that followed was a difficult setback for GATT, which was trying to conclude the Uruguay Round of multilateral trade negotiations. The need to build confidence in trade liberalization and to make a contribution to the United Nations Conference on Environment and Development prompted GATT to focus on examining trade provisions in multilateral environmental agreements (MEAs) vis-à-vis GATT principles and provisions, on transparency of national environmental regulations likely to have trade implications, and on trade effects of new packaging and labelling requirements aimed at protecting the environment. Following the United Nations Conference on Environment and Development, the GATT/World Trade Organization trade-environment agenda was expanded to include matters raised in Agenda 21 with a view to making trade and environmental polices mutually supportive. With the establishment of the World Trade Organization, the GATT Group on Environmental Measures and International Trade was upgraded to a World Trade Organization Committee on Trade and Environment to reflect the broadened scope of the World Trade Organization Agreements.[24] A number of important trade and environment issues found their way into the World Trade Organization "built-in agenda", which goes beyond those Agreements to include new negotiations in some areas such as agriculture and services, and assessments of the situation at specified times in other areas.

32. While the Uruguay Round was being negotiated, many major international environmental agreements were also being elaborated, culminating in the United Nations Conference on Environment and Development and the signing of the United Nations Framework Convention on Climate Change and the Convention on Biological Diversity. The complex structure of the international environmental regime has progressively involved the United Nations Environment Programme (UNEP) and numerous other public and private actors. Promoting synergies between the World Trade Organization and MEAs, and developing an institutionalized, predictable, widely accepted approach to the use of trade measures for environmental purposes have become a major issue.

C. Science and the public

33. Much disagreement on the issue of trade measures for environmental protection in recent years has concerned the relative importance to be given to science and societal preferences. The precautionary

principle"[13] has gathered considerable international support and has found its way into a number of international environmental instruments, most recently the Cartagena Protocol on Biosafety (adopted by the Conference of the Parties to the Convention on Biological Diversity on 29 January 2000 (decision EM-1/3)). Among the relevant World Trade Organization instruments, the Agreement on the Application of Sanitary and Phytosanitary Measures specifically addresses situations of scientific uncertainty. In addition to scientific assessment of risk, other factors also play a role in the decision-making process, including potential liabilities faced by decision makers, the costs of precautionary measures, the acceptability of risks, which can vary within society and among countries, and social concerns and public participation. How to reconcile these factors is a question of ongoing debate.

34. The post-United Nations Conference on Environment and Development debates concerning trade liberalization and environmental protection have amply demonstrated the need for broad public support for progress in integrating the two objectives. Environmental and development non-governmental organizations, together with other institutions of civil society, have been able to mobilize sufficient public sentiment to disrupt multilateral economic and trade negotiations. The High-level Symposia on Trade and Environment, and Trade and Development, convened by members of the World Trade Organization in 1999, were an important precedent towards bringing together the trade, environment and development communities, clarifying the role of the World Trade Organization in environmental matters, and reconciling trade and sustainable development policies and objectives.

35. Although a large proportion of the recent public debates over trade and environment issues have been based on misunderstandings, the debates have brought to the fore valid concerns about the impact of trade liberalization on human well-being and environmental quality. They have also demonstrated that continued conflict between the environmental and trade communities would be harmful to the goals of both.

Notes

[1] *Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992*, vol. I, *Resolutions Adopted by the Conference* (United Nations publication, Sales No. E.93.I.8 and corrigendum), resolution 1, annex II.

[2] Organisation for Economic Cooperation and Development (OECD) Development Assistance Committee (*http://www.oecd.org/dac*), December 2000.

[3] World Bank, *Global Development Finance 2000* (Washington, D.C., May 2000), box 3.1.

[4] Background paper No. 2 entitled "Financial flow statistics" (DESA/DSD/2000/2), prepared for the eighth session of the Commission for Sustainable Development.

[5] UNCTAD, *World Investment Report 2000*, (United Nations publication, Sales No. E.00.II.D.20), annex table B.2.

[6] Ibid., overview, p. xvi.

[7] Ibid., p. xv.

[8] Report of the Secretary-General entitled "Towards a stable international financial system, responsive to the challenges of development, especially in the developing countries" (A/55/187), table.

[9] UNCTAD, *World Investment Report 2000*, p. xvi.

[10] Report of the Secretary-General entitled "Towards a stable international financial system, responsive to the challenges of development, especially in the developing countries" (A/55/187), table.

[11] Ibid.

[12] Heavily Indebted Poor Countries (HIPC) website, *http://www.worldbank.org/hipc/*, 22 December 2000.

[13] Background paper No. 15 entitled "Finance for sustainable development: testing new policy approaches" prepared for the eighth session of the Commission for Sustainable Development, containing the article entitled "Overview of recent experiences with ecological tax reforms in Europe", by Kai Schlegelmilch, p. 185.

[14] Report of the Secretary-General entitled "Financial resources and mechanisms" (E/CN.17/2000/2), para. 59.

[15] Background paper No. 15 entitled "Finance for sustainable development: testing new policy approaches" prepared for the eighth session of the Commission for Sustainable Development, containing the article entitled "Advancing subsidy reform: towards a viable policy package", p. 171.

[16] See United Nations Environment Programme, *Convention on Biological Diversity* (Environmental Law and Institution Programme Activity Centre), June 1992.

[17] General Assembly resolution 54/196.

[18] A/AC.257/12.

[19] These sectors include major agricultural staple foods products, fruit, vegetables, fish etc.; the food industry; textiles and clothing, footwear, leather and travel goods, and the automotive sector, as well as a few other transport and high technology goods such as consumer electronics and watches.

[20] According to Special Study 4 "Trade and Environment" by the World Trade Organization (available at *http://www.wto.org/english/tratop_e/envir_e/environment.pdf*, p. 4), developed countries' share of polluting industries has remained more or less constant (at about 75-80 per cent) in recent decades and has even increased marginally in the 1990s.

[21] Pre-tenth session of UNCTAD seminar on FDI and sustainable development, Palais des Nations Unies, Geneva, November 1999 (see *http://www.unctad-10.org/index-en.htm*).

[22] Well-known examples include subsidies for energy, agriculture, and fishing, which aggravate pollution and resource degradation.

[23] See *http://www.wto.org/english/tratop_e/envir_e/edis00_e.htm*.

[24] See *Legal Instruments Embodying the Results of the Uruguay Round of Multilateral Trade Negotiations, done at Marrakesh on 15 April 1994* (GATT secretariat publication, Sales No. GATT/1994-7).

[25] Principle 15 of the Rio Declaration on Environment and Development (*Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992*, vol. I, *Resolutions Adopted by the Conference* (United Nations publication, Sales No. E.93.I.8 and corrigendum), resolution 1, annex I).

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Transfer of environmentally sound technologies, cooperation and capacity-building

Environmentally sound management of biotechnology*

Report of the Secretary-General

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I. Introduction

1. The present report reviews changes, accomplishments and constraints with regard to the transfer of environmentally sound technologies and the sound management of biotechnology. It examines how, since the United Nations Conference on Environment and Development, technology transfer has come to be understood in new ways, and how the accelerated pace of technological development and uncertainties regarding the benefits and problems of biotechnology have made it an issue of global concern in a very short time. The report considers the contribution of each to sustainable development.

II. Transfer of environmentally sound technologies, cooperation and capacity-building

2. Work on the topic of environmentally sound technologies and cleaner production has focused largely on industrial technologies. There has also been work on the development and transfer of technologies for sustainable development in the fields of agriculture, health, water, urban management, energy and transportation. Those areas will be addressed in other reports.

A. Approaches to environmentally sound technologies

3. Agenda 21 defines environmentally sound technologies as technologies that "protect the environment, are less polluting, use all resources in a more sustainable manner, recycle more of their wastes and products, and handle residual wastes in a more acceptable manner than the technologies for which they were substitutes".[1] It states that they "are not just individual technologies, but total systems which include know-how, procedures, goods and services, and equipment as well as organizational and managerial procedures".[2]

4. With this definition, the Commission on Sustainable Development and many other national and international organizations have concentrated their efforts on the identification of industries and economic sectors to which technology substitutes could be transferred and on the identification of technologies to be transferred. The focus of the work has not been on the development of environmentally sound technologies but on promoting access to them and assisting in their integration and use, through information, education and financing, taking into account the national contexts in which they are to be used.

5. Until the 1990s, most of the work on environmentally sound technologies focused on the development and transfer of "end-of-pipe" technologies for removing harmful substances from emissions and effluents and treating them or disposing of them safely. During the 1990s, the focus shifted to cleaner production, reducing or eliminating the generation of harmful substances in the production process. The concept of cleaner production, launched by the United Nations Environment Programme (UNEP) in 1989, promoted the shift from end-of-pipe to cleaner production solutions. The shift has subsequently been reflected in the emergence of a variety of new concepts, including pollution prevention, eco-efficiency, factor 4 and factor 10.

6. The focus on cleaner production has been strengthened by the recognition of the profitability of cleaner production, which can generate financial benefits for the enterprise both directly, through reduced costs for raw materials, waste treatment, insurance and liability, and indirectly, though green marketing and better public relations. These financial benefits, which are increasing as environmental protection policies are strengthened and environmental costs internalized, are being identified and quantified through new management and accounting systems such as environmental management accounting and environmental management systems. In other cases, the introduction of cleaner technologies may not be profitable to the enterprise but may still be justified economically, based on the external environmental benefits.

B. Government policies and strategies

7. Long-term studies in many countries suggest that advances in technology have been responsible for at least half of long-term economic growth, through improvements in capital and labour productivity and the introduction of new processes, products and services. To promote technological development actively, some countries have started to develop

national technology strategies, including a consideration of cleaner technologies. These strategies focus on three complementary goals:

(a) Building industries that are competitive in both domestic and global markets and that contribute to sustainable development;

(b) Establishing business conditions attractive to technology-oriented investment, including foreign investment, technology transfer and managerial know-how;

(c) Promoting public/private research and development partnerships to promote adaptation, commercialization and spin-off of cleaner technologies.

International assistance, such as that provided by the Department of Economic and Social Affairs, United Nations Secretariat, has supported the development of these new strategies.

8. The transfer of cleaner technologies to developing countries has been most effective when it has been driven by demand from enterprises in those countries. The demand depends to a large extent on national policies for sustainable development. In general, countries with strong environmental policies have benefited from more technology transfer and more rapid economic growth than countries with weak environmental policies.

9. Successful environmental policies supporting the transfer of cleaner technologies have generally been based on flexible approaches that include economic incentives and technical assistance to enterprises, as well as regulatory measures. Such flexible measures have been effective in promoting more productive cleaner technologies, rather than more costly "end-of-pipe" pollution abatement measures.

10. A growing number of countries, often with assistance from international organizations or donor countries, have established national cleaner production centres. These centres, most of them created under the programmes of the United Nations Industrial Development Organization (UNIDO)/UNEP, the World Environment Center (WEC) and the United States Agency for International Development (USAID), assist national enterprises in acquiring and incorporating cleaner production methods through training, technical assistance, demonstration projects and contacts with sources of cleaner technologies. Such centres have been an effective means for the transfer of cleaner technologies both internationally and within countries, particularly for small and medium-sized enterprises.

11. The development of government policies to promote the transfer of environmentally sound technologies, such as financial incentives, has been limited by a lack of assessment tools for identifying technologies as environmentally sound technologies. Environmental soundness is largely relative to the technologies currently in use, which the new technologies are intended to replace. The classification of technologies as environmentally sound therefore differs among countries and evolves over time. Tools and skills for applying the new "environmental verification of technologies" and "environmental technology assessment", which have been developed to assist in assessing the environmental soundness of technologies in specific contexts, are not yet widely available in developing countries.

C. Financing technology transfer and international cooperation

12. While investment in cleaner production may be profitable for an enterprise and beneficial to society, financing such investment may pose problems. Investment capital for cleaner production may be unavailable, either because the returns are not fully recognized or because the enterprise does not have access to credit. In addition, there may be public benefits that are not reflected in revenues to the enterprise.

13. A large number of funds and programmes have been created by donors, international financial institutions and others to promote the transfer of environmentally sound technologies on terms and conditions more favourable than those available in commercial financial markets. Such programmes include assistance through grants, special credit lines, lower interest rates, technical assistance, reduction of licensing fees or property rights, and training. In addition, the share of official development assistance (ODA) allocated to environmental protection has grown substantially, increasing the available funding for technology transfer from that source.

14. Several international environmental agreements, including the United Nations Framework Convention on Climate Change, the Montreal Protocol to the Vienna Convention on the Protection of the Ozone

Layer, and the Convention on Biological Diversity, include provisions for new and additional financial assistance to support the transfer of environmentally sound technologies. Such assistance — provided, for example, through the Global Environment Facility and the Multilateral Fund of the Montreal Protocol — has been instrumental for many developing countries in obtaining cleaner and more advanced technologies. The Clean Development Mechanism of the Kyoto Protocol to the United Nations Framework Convention on Climate Change may be an important source of finance for the transfer of cleaner technology but needs to be elaborated.

15. Despite the new funds and programmes, there is not enough financial assistance available to support the technology transfer required to prevent environmental degradation resulting from industrial development and increased consumption.

16. However, some of the funds available to support transfer of environmentally sound technologies are not being used as fully and effectively as they could be, due to limited capacity for investment planning that combines financial and environmental assessment. There are substantial sums of money seeking good projects and not enough well developed project proposals for the funds. In addition, information on available funds, assistance programmes and conditions is not easily accessible, limiting the ability of enterprises and agencies to obtain support.

17. Furthermore, international assistance for the transfer of technology is often supply-driven, thus limiting its effectiveness in addressing the priority concerns of receiving countries. A shift to a more demand-driven approach is being pursued by certain receiving countries through improved planning mechanisms and domestic capacities, better to match national economic, social and environmental priorities with available international support. The success of these efforts by receiving countries depends, in part, on a similar shift in policy by the sources of international assistance.

D. Foreign direct investment, trade and technology transfer

18. The transfer of cleaner production technologies is largely a business-to-business operation, and technologies are constantly being transferred through foreign direct investment (FDI), trade and other business transactions. However, not all foreign direct investment involves technology transfer, and not all of the technology transferred is environmentally sound. There is no agreed way to assess the amount of technology transferred or the percentage of that technology that is environmentally sound.

19. Nonetheless, there is general agreement that the rapid growth in trade and foreign direct investment in recent years, as part of the globalization process, has been accompanied by an increase in technology transfer. Global FDI inflows reached $865 billion in 1999, a four-fold increase from the 1988-1993 average. Of that total, $208 billion has gone to developing countries, up from about $47 billion for 1988-1993.[3] The main sources of FDI are large transnational corporations from developed countries with strong research and development efforts, with the need to amortize the cost of that research over as wide a market as possible.[4] The work of the United Nations Conference on Trade and Development in this area has contributed to integrating sustainable development into FDI and the activities of transnational corporations.

20. Stronger environmental standards in both developed and developing countries, expanding markets for green products, and increasing public pressure for improved environmental performance by business also contributed to increases in the transfer of cleaner technologies through business transactions. An increasing number of multinational corporations are adopting global environmental standards for all of their operations and those of their suppliers.

E. Information systems and technologies

21. Agenda 21 stresses the need for the development and linking of information systems to support the transfer of environmentally sound technologies. Since the United Nations Conference on Environment and Development, a large amount of information on cleaner technologies has become available, and a large number of information systems on such technologies have been established by both United Nations agencies and other international and national organizations. Those systems lack the networking needed to reach their full potential for information dissemination.

22. The development of the Global Information Network on Cleaner Production, together with the

existing European Good Environmental Practices Network, and the new Information Network of Cleaner Production Centres and the Sustainable Alternatives Network, currently under development, promise to improve accessibility of information on cleaner technologies.

23. Advances in information and communication technologies, in particular the development of the Internet, have been central to the process of globalization. While the new information and communication technologies can certainly contribute to economic development and environmental protection by improving the efficiency of production and distribution, their overall impact on the environment is not yet clear. E-commerce, for example, both retail and business-to-business, is growing rapidly and opening new markets for businesses in both developed and developing countries. However, studies indicate that the new production and distribution systems based on the Internet and other information systems can either reduce environmental impacts, particularly through reductions in storage and retail space, or increase them, particularly through more energy-intensive transportation. There are also concerns that increased use of advanced information and communication systems may further marginalize countries, communities and enterprises that are not well connected to information networks.

III. Environmentally sound management of biotechnology

24. This section of the report focuses on progress in establishing enabling mechanisms for the development and the environmentally sound application of biotechnology.

25. The advent of molecular biology in the mid 1970s and what became known as the "new" biotechnology (henceforth referred to as "biotechnology") promised great opportunities for addressing major development problems. Improved health care, enhanced agricultural productivity, cleaner energy and environmental protection were among the goals of biotechnology.

26. Agenda 21 recognizes the potential contribution of biotechnology as a tool for sustainable development, with applications in five areas:

(a) Increasing the availability of food, feed and renewable raw materials;

(b) Improving human health;

(c) Enhancing protection of the environment;

(d) Enhancing safety in the use of biotechnology and developing international mechanisms for cooperation;

(e) Establishing enabling mechanisms for the development and the environmentally sound application of biotechnology.

27. Ten years after Rio, biotechnology has developed into an economically important industry, but most of the benefits foreseen for sustainable development have not been realized. In some industrialized countries, biotechnology is a profitable field that plays a strategic role in enhancing national competitiveness in a global economy, although concerns about its risks are growing. For the developing world, biotechnology is still awaiting the fulfilment of the early social and economic expectations.

28. Biotechnology, like other strategic technologies, has been driven by commercial imperatives, and the capital requirements for product development and regulatory approval are often substantial. Investment capital for development and commercialization has been available mainly through private venture capital in the advanced industrialized countries. As a result, innovation has been dominated by the private sector and is increasingly proprietary and thus mostly unobtainable by the large majority of developing countries. Technology development and transfer to developing countries have been further hindered by a scarcity of human and financial resources and the drastic decline in public funding for indigenous research and development.

29. In view of these constraints, only a few of the larger developing countries have an incipient biotechnology capacity. For the large majority of developing countries, the United Nations system and other international technical assistance agencies remain the main conduits of technology transfer. Since the Conference on Environment and Development, efforts through several international programmes have resulted in some biotechnology products and processes, particularly in health and agriculture. However, their impact for economic and social development has been limited, due to declining donor budgets, changing

donor priorities and unequal relations between industrial and developing partners in existing collaborative activities.

30. Private-sector investment in biotechnology will not only drive innovation and product development but can also promote economic growth in developing countries. Public and non-profit institutions will remain important in promoting the broader, non-commercial goals of biotechnology. Indeed the major challenge now is to find the means to develop biotechnology-based public goods while maintaining corporate incentives for biotechnology innovation.

31. Biotechnology raises important ethical and social issues. These include equitable distribution of benefits, biosafety, and responsibility to future generations. The impacts cannot easily be confined within national boundaries and will often differ among countries, depending on local ecological, social and economic situations. Efforts are now under way to address urgent issues, including: strengthening the capacity of developing countries to acquire and integrate biotechnology safely into sustainable development programmes; providing forums for private and public institutions and civil society to consider policy options and discuss controversial issues at national, regional and international levels; and establishing innovative mechanisms and special funds for research on the critical needs of poorer countries.

Notes

[1] *Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992* (United Nations publication, Sales No. E.93.I.8), resolution 1, annex II, para. 34.1.

[2] Ibid., para. 34.3.

[3] *World Investment Report 2000* (Geneva, UNCTAD, 2001), p. 283.

[4] *World Investment Report 1999* (Geneva, UNCTAD, 2000), p. 199, pp. 203-228.

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Protection of the atmosphere*

Report of the Secretary-General

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* The present report was prepared by the World Meteorological Organization and the United Nations Environment Programme as task managers for chapter 9 of Agenda 21, with contributions from other United Nations agencies and international organizations. The report is a brief factual overview, which intends to inform the Commission on Sustainable Development on key developments in the subject area.

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Introduction

1. The purpose of the present report is to provide a succinct summary of factual material relating to the protection of the atmosphere. The summary is based primarily on the in-depth review of the ninth session of the Commission on Sustainable Development, supplemented by more recent material that has come available from the work of the Intergovernmental Panel on Climate Change (IPCC) established by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO). There have been several distinct tendencies in atmospheric conditions during the decade of the 1990s and since the United Nations Conference on Environment and Development held at Rio that have continued from previous decades.

I. Global atmospheric trends

2. The Earth's climate has been relatively stable since the last ice age, with global temperature changes of less than 1° Celsius (C) over a century during the past 10,000 years. During this time, modern society has evolved and, in most cases, successfully adapted to the prevailing local climate and its natural variability. However, the Earth's climate is now changing. The Earth's surface temperature[1] during the twentieth century was clearly warmer than during any other century for the last thousand years, that is to say, the climate of the twentieth century was clearly atypical. According to IPCC, the Earth's atmosphere near the surface warmed overall by between 0.4° and 0.8° C over the past 100 years, with air over land areas warming more than the ocean surface, and with the last two decades of the twentieth century being the hottest in that century. Recent research by WMO shows that the 10 warmest years have all occurred since 1983, with 8 of these having occurred since 1990. As a new century begins, the global mean temperature is 0.6° C above the estimate for the start of the twentieth century. The year 2000 continued the run of warm years in spite of the persistent cooling influence of the tropical Pacific La Niña event and was the twenty-second consecutive year with the global mean surface air temperature above the 1961-1990 normal.

3. In addition to the direct evidence from temperature records of global-scale warming of the atmosphere near the Earth's surface, there is substantiation from increasing sea level (owing partly at least to thermal expansion), the retreat of many of the world's glaciers, and the thinning of Arctic sea ice.

4. Increases in temperature will change the distribution of vectors for malaria and other tropical diseases, and adversely influence agricultural patterns in already vulnerable parts of the world. Rises in sea level will place low-lying countries at risk for severe flooding, cholera and other waterborne diseases. In addition, extreme weather events are expected to increase in frequency and/or severity, and have important health impacts, with the burden falling disproportionately on the poor.

A. Global and regional precipitation

5. There is evidence that precipitation patterns are changing in systematic ways with large areas of the world's continents experiencing extended upward and downward trends. Precipitation increased by 0.5-1 per cent per decade in the twentieth century over most mid and high latitudes of the northern hemisphere continents and also over much of Australia and South America, except for the west coast of both continents. Rainfall decreased during the twentieth century over much of the tropical and subtropical land areas north of the equator, including Africa, East Asia and the Americas, although it has recovered in some areas during recent years. In Western Europe, Southern Africa and parts of Central Asia, there appear to be no distinct trends.

B. Global-scale greenhouse gas concentrations

6. The atmospheric concentrations of greenhouse gases have increased because of human activities, primarily owing to the combustion of fossil fuels (coal, oil and gas), deforestation and agricultural practices.

7. The concentration of atmospheric carbon dioxide (CO_2) has now risen to over 360 parts per million from a pre-industrial level of about 270 parts per million. Changes in the ratio of carbon isotopes in atmospheric CO_2 confirm that the increase is a consequence of human activities. CO_2 has an effective lifetime in the atmosphere of about 100 years, so that its global mean concentration responds only very slowly to changes in emissions. This means that about one third of the CO_2

resulting from human activities in the recent past will still be present in 100 years' time. Anthropogenic CO_2, then, is making the largest direct additional contribution to radiative forcing at present and is likely to do so for some time into the future. Stabilization of CO_2 emissions at current values could slow the consequent projected climate change but still leave atmospheric concentrations rising. Emission reductions of about 60-70 per cent would be needed to prevent CO_2 concentrations from rising further.

8. In addition to the higher concentration of CO_2 in the atmosphere (about 30 per cent), the concentration of methane has more than doubled, while that of nitrous oxide (N_2O) has increased by about 15 per cent. Methane and N_2O also act as greenhouse gases. The burning of fossil fuels has, in addition, caused the atmospheric concentrations of sulphate aerosols to increase in some regions, primarily in the northern hemisphere. However, while greenhouse gases tend to warm the atmosphere near the Earth's surface, aerosols can result in cooling.

C. Global stratospheric ozone concentrations

9. The combined abundance of ozone-depleting chlorine compounds in the stratosphere has apparently peaked and is now slowly declining. Chlorine is no longer increasing because the total consumption of chlorofluorocarbons (CFCs) worldwide had decreased dramatically from about 1.1 million tons in 1986 to 156,000 tons by 1998. The parties to the Vienna Convention for the Protection of the Ozone Layer[2] have phased out 85 per cent of the production of those chemicals that destroy the ozone layer. The remaining 15 per cent is mainly produced and consumed in developing countries which have until 2010 to phase out most of the major ozone depleting substances. By July 2000, 176 countries had ratified the Vienna Convention and 175 countries the Montreal Protocol on Substances that Deplete the Ozone Layer.[3]

10. Although total chlorine is declining, total bromine is increasing according to the Scientific Assessment Panel of the Montreal Protocol. Bromine is much more effective than chlorine at destroying ozone.

11. One measure of the success of the Montreal Protocol and its subsequent Amendments and Adjustments is that without the Montreal Protocol, by the year 2050, the amount of ozone depleting chemicals in the atmosphere would have been five times greater. Ozone depletion would have risen to 50 per cent in the northern hemisphere mid latitudes and 70 per cent in southern hemisphere mid latitudes, about 10 times worse than current levels. The result would have been a doubling of ultraviolet radiation of relative short wavelengths (UVB) reaching the Earth in northern hemisphere mid latitudes and a quadrupling in the southern hemisphere. The implications for human health would have been very serious. 19 million additional cases of non-melanoma skin cancer, 1.5 million more cases of melanoma and 129 million more cases of eye cataracts.

12. The severe destruction of stratospheric ozone over the Antarctic continent (the "ozone hole") was first detected in the mid-1980s using ground-based measurements from stations operating under the WMO Global Atmosphere Watch network. The stratosphere contains 90 per cent of total atmospheric ozone. The seasonal occurrence of the Antarctic ozone hole (during southern hemisphere springtime) has continued up to the present time. Its formation requires stratospheric temperatures below -78° C, which allow the formation of polar stratospheric clouds, levels of chlorine above about 2 parts per billion by volume and sunlight to activate the ozone destroying chemistry of chlorine. The chlorine loading (currently at 4 parts per billion by volume) is a direct result of the use of CFCs as refrigerants, insulators, cleaning agents and propellants in spray cans.

13. At its maximum each year, the ozone hole can cover an area greater than 20 million square kilometres with almost total destruction of the stratospheric ozone at times in some locations within the hole. The Vienna Convention came into force in 1985, and together with its Montreal Protocol (1987) and the subsequent Amendments thereto, has effectively curtailed the release of CFCs into the atmosphere. Because CFCs have such long lifetimes however, the chlorine associated with them is not expected to decline below the critical 2 parts per billion by volume in the stratosphere until mid-century. It is expected, therefore, that the low springtime Antarctic ozone levels will occur for some time.

14. Fortunately for most of humanity, this extreme loss of atmospheric ozone, with its attendant increase in harmful ultraviolet radiation reaching the Earth's surface, occurs over largely uninhabited areas. Its

effect on marine ecosystems is unknown at this point, but studies are under way in various countries to determine any impacts.

15. Ozone depleting substances, which include CFCs, are being replaced by hydrofluorocarbons (HFCs) and, to a lesser extent, by perfluorocarbons (PFCs); and consequently, concentrations of the latter substances in the atmosphere are increasing. HFCs and PFCs have significant global warming potential and the Kyoto Protocol[4] to the United Nations Framework Convention on Climate Change[5] has included HFCs and PFCs in a basket of six gases whose emissions are to be reduced by industrialized countries. The global warming potentials of substitutes for ozone depleting substances have been evaluated by the Scientific Assessment Panel of the Montreal Protocol and IPCC. Options for reducing global warming contributions by substitutes for ozone depleting substances have been evaluated by the Technology and Economic Assessment Panel of the Montreal Protocol and IPCC. Both Assessment Panels of the Montreal Protocol are working closely with IPCC to address the problem of HFCs and PFCs in the context of the two Protocols.

II. Regional air pollution

16. Large-scale regional air pollution is found principally in eastern North America and Europe and increasingly in East Asia. Although naturally occurring episodes of regional "pollution" can be caused by lightning-initiated forest and grassland fires, the chronic regional pollution that is so much a matter of concern is often the consequence of human activities.

17. In the three regions mentioned, a combination of intense industrialization, large population numbers and density, and the ubiquitous automobile results in high pollution levels over large areas. Sulphur, nitrogen oxides, heavy metals and organic compounds are among the principal pollutants. Sulphur and nitrogen, carried aloft by air currents, can lead to the formation of acid rain which may fall to Earth hundreds and thousands of kilometres from their source regions. Acid rain is thought to have contributed to the disappearance of fish from thousands of lakes in both Europe and North America and to extensive damage to forests.

18. Substantial progress in reducing regional air pollution has been achieved in Europe and North America. Europe where a number of international agreements are now in place limiting emissions of sulphur, nitrogen oxides, volatile organic compounds, heavy metals and persistent organic pollutants. These have resulted in significant reductions with, for example, in Europe, sulphur emissions having fallen from more than 40 million tons to 22 million tons per year between 1990 and 1998.

19. More recently, regional pollution has become an important issue in many developing countries. In a number of regions, agreements have been adopted to address the problem. They include East and South-East Asia, southern South America and Southern Africa. Nevertheless, because of rapid industrialization and urbanization, the situation is most acute in East Asia and particularly so in South-East Asia, which is also affected by extensive, episodic biomass burning events.

20. Each ecosystem reacts differently to the same input of acid rain and other pollutants. Sensitivity maps showing the most susceptible ecosystems indicate that, in 1990, there were few areas at risk in East and South-East Asia. However, deposition scenarios for 2025 indicate that large areas will be at risk by that date.

III. Urban air pollution

21. The urban environment is where an increasing share of the world's population lives. According to the United Nations,[6] 4.9 billion inhabitants out of 8.1 billion are predicted to live in cities by 2030. This compares with 2.9 billion out of 6.1 billion at the present time. With increased urbanization comes increased urban air pollution associated with the transportation, energy and industrial sectors. In some of the world's major cities, for example, Los Angeles, Mexico City and Beijing, local topography and climate exacerbate levels of urban pollution. Urban pollution characteristics vary enormously spatially, temporally and between individual cities.

22. Common pollutants in urban areas are non-methane hydrocarbons (NMHCs), nitrogen oxides, sulphur dioxide and various types of particulate matter. Urban smog, common in many cities, is a result of the action of sunlight on NMHCs and oxides of nitrogen, and the same process also produces harmful levels of ozone. Pollution is harmful to human health and the built environment. For instance, many world heritage

and increased incidence of diseases and deaths may result from exposure to increased levels of air pollution (for example, small particulates less than 2.5 microns in diameter). The fact that outdoor air pollution levels also interact with indoor air pollution levels is a particular problem where biomass and coal are used for domestic cooking and heating.

23. Many developed-country cities and some developing-country cities now have monitoring systems that provide air quality information. In some cities, the authorities can enact control measures such as restricting traffic or ordering certain industries to reduce operations to lower pollution levels. To assist city authorities, the World Health Organization (WHO) has produced air quality guidelines based on health studies and WMO is working with national meteorological services to improve urban air pollution forecasting.

IV. Issues for further consideration

24. In view of the recent findings of IPCC in its Third Assessment Report that there is evidence of substantial vulnerabilities to the projected climatic changes, particularly for the poor populations and populations in coastal areas, there is a need to draw greater attention to the adaptive capacity and vulnerabilities of populations, natural systems and regions, and to the links between climate change and sustainable development and equity.

25. Overarching issues such as capacity-building, education and training, and raising public awareness, need to be taken into careful consideration, as well as the increased need for assessments of climate and environmental change and quantitative methods for comparative assessment and decision support analyses.

Notes

[1] The Earth's "surface temperature" is generally taken as that of the air at about 2 metres above the surface. The temperature of the land surface itself can vary significantly with respect to the adjacent air temperature at any given time. The temperatures used to derive the mean surface air temperature over land are typically the local daily maximum temperature and minimum temperature. Over the Earth's oceans, temperatures of the sea surface, as measured from ships and buoys, have can also vary with respect to the adjacent air temperature but generally by not as much as over land. The impact of using the surface temperature of the sea instead of the maritime air temperature to determine the trend in the mean global surface air temperature record is currently under investigation but is expected to be small.

[2] United Nations, *Treaty Series*, vol. 1513, No. 26164.

[3] Ibid., vol. 1522, No. 26369.

[4] Framework Convention on Climate Change/CP/1997/7/Add.1, decision 1/CP.3, annex.

[5] A/AC.237/18 (Part II)/Add.1 and Corr.1, annex I.

[6] "World Urbanization Prospects: The 1999 Revision, key findings", prepared by the Population Division, Department of Economic and Social Affairs of the United Nations Secretariat.

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Agriculture, land and desertification*

Report of the Secretary-General

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* The present report was prepared by the Food and Agriculture Organization of the United Nations as task manager for chapters 10 and 14, and the United Nations Environment Programme as task manager for chapter 12, of Agenda 21, with contributions from other United Nations agencies and international organizations and major groups. The report is a brief factual overview, which is intended to inform the Commission on Sustainable Development on key developments in the subject area.

Introduction

1. The present report highlights major trends and emerging issues affecting the thematic cluster of integrated planning and management of land resources, desertification and drought, and sustainable agriculture and rural development, dealt with in chapters 10, 12 and 14, respectively, of Agenda 21.[1] It presents a brief review of developments in these areas since the United Nations Conference on Environment and Development and assesses the opportunities for further actions in support of the goals contained in those chapters of Agenda 21, as well as related agreements.

2. While there has been progress globally in increasing food production and in understanding and implementing better natural resources management since the United Nations Conference on Environment and Development, problems of food security, poverty and land degradation still remain. The extraordinary combination of greater world food supply and lower prices that continued through the 1990s appeared to allay the fears of previous decades of rising population rates and imminent famine in Asia and elsewhere. Nevertheless, it is estimated that, at the close of the twenty-first century, more than 820 million people in the world remain undernourished, including 790 million living in developing countries and a further 34 million living in industrialized countries and countries with economies in transition.[2]

3. The problems of hunger and poverty are inextricably linked and one cannot be solved without tackling the other. While the total number of people living in poverty, based on an international poverty line of US$ 1 per day, is estimated to have fallen slightly in the 1990s, the figure still amounts to about 1.2 billion people.[3] In recognition of the critical importance of these issues, world leaders at the World Food Summit in 1996 agreed to a minimum target of halving the number of undernourished people in the world by 2015. This goal was reiterated by the Millennium Summit of the United Nations in September 2000, where Governments further committed themselves to reducing by half the number of the poor, also by the year 2015.[4]

4. The degradation of land resources is a global phenomenon. It is estimated that worldwide soil degradation affects over 2 billion hectares, putting at risk the livelihoods of more than 1 billion people. About two fifths of the land surface are drylands, with limited freshwater supplies, and a large proportion of this is considered degraded to some extent. About 65 per cent of all arable land may have already lost some biological and physical functions. The United Nations Environment Programme (UNEP) estimates that desertification (which occurs in arid, semi-arid and dry sub-humid areas) costs the world approximately US$ 42 billion a year.[5] It is in response to these problems and their global impact that 174 countries have ratified the United Nations Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, particularly in Africa,[6] which also addresses related land degradation issues in an integrated manner.

5. About 75 per cent of the poor live in rural areas. Despite increasing urban poverty, projections are that a majority of the poor would continue to live in rural areas well into the twenty-first century.[7] Therefore efforts to combat persistent hunger and poverty, especially in sub-Saharan Africa, where nutrition and income levels have actually declined over the last decade, and in South and East Asia, where the largest number of the poor live, must address the rural areas and, in particular, agriculture and land issues. The challenge is to alleviate poverty and achieve food security while ensuring the sustainable use and management of land and other natural resources. The concept of sustainable agriculture and rural development (SARD), which has as its major objective to increase food security in an environmentally sound way so as to contribute to sustainable natural resource management, offers an approach to achieve this.[8]

I. Global issues affecting agriculture and land use

6. Both the global production of cereals and global cereal crop yields rose over the 10 years from 1986-1988 to 1996-1998. The largest gains were in developing countries. However, average per capita cereal production for the world remained stagnant over the period and actually fell in Africa and the Middle East regions, where population growth was the highest.[9] The continued growth in the global population until at least 2050 will require further increases in agricultural production, without placing soils, water and the environment in peril. According to the Food and Agriculture Organization of the United Nations (FAO), the process of globalization, which

accelerated during the 1990s, has already had a fundamental impact on agricultural production and use of resources. In many countries, the development of local and global competitive markets has stimulated enterprise changes and innovation in agricultural and land management practices, contributing to greater world food supply, increased responsiveness to changing patterns of consumer demand and lower real prices; but other countries have not effectively adjusted policies and programmes to benefit from new market situations. Moreover, the reduction of global food prices by about 10 per cent over the last decade, while welcome in many urban markets, can undermine the economies of small-scale agriculture in many developed and developing countries.

7. As trade barriers have been reduced, many agricultural producers in Africa, Asia and Latin America are facing increasing competition from neighbouring countries and industrialized country producers, while at the same time trying to cope with declining support services and the loss of subsidies owing to structural adjustment and liberalization policies. However, improvements in transport and marketing systems in many areas, in conjunction with economic growth and urbanization, are increasing market demand for products with added value through transformation and processing. The rural poor and small farmers have clearly benefited the least from globalization, while changes and innovations resulting from new policies and programmes have mostly benefited larger enterprises, especially vertically integrated firms with global reach.

8. Vertical integration in food systems from producer to consumer has accelerated, the major impact being on the livestock subsectors. In some areas, farmers' groups have responded effectively by creating cooperatives and larger-scale business arrangements for the production and marketing of agricultural goods for the global marketplace. Another trend that has intensified in the 1990s is the consolidation of large-scale agribusiness. Although investment levels in biotechnology industries appear to have declined in the current period, businesses dealing in agricultural inputs, grain trading, processing, machines and technologies tend to be concentrated in a fewer number of firms with a global spread. These large private enterprises can have profound effects on agriculture and land use. The initiatives of civil society, local business and Governments can act as a necessary balance to ensure that the interests of small-scale agricultural users are protected.

9. Examples of successful natural resources management include the use of sustainable agricultural technologies, such as the adoption of reduced tillage on nearly 60 million hectares in diverse countries and the instruction of 670,000 farmers in Asia in integrated pest management (IPM) techniques. The value of land resources as a carbon sink is currently being recognized in the context of the negotiations of the Kyoto Protocol[10] to the United Nations Framework Convention on Climate Change,[11] and the importance of genetic resources in agriculture is given growing attention in the implementation of the Convention on Biological Diversity.[12]

10. Nevertheless, global trends in land degradation, soil loss and desertification persist with particular intensity and impact for many lower-income countries and less advantaged groups. They have decreased the livelihoods of smallholder farmers and induced changes in land-use systems leading to a vicious circle of further resource depletion. The stress on the environment and land resources caused by natural disasters and climate-related events, such as droughts, floods, landslides, earthquakes and volcanic eruptions, is an additional burden, especially for the most vulnerable communities. Even more critically, man-made problems, such as deforestation, overgrazing, agricultural mismanagement, industrial contamination and urban sprawl, are a major cause of land loss. And, most tragically, civil strife and wars continue to cause not only the degradation of agricultural lands but also food shortages, malnutrition, famine, internal displacement and refugee situations, and other threats to human health.[13]

11. Increased resources, new solutions and vigorous action in support of rural communities are urgently needed to address the global challenges and overcome the constraints on development faced by the poor, marginalized and disadvantaged, in particular women, indigenous peoples and small farmers. The new relationships forged since the Rio Summit in 1992 among the many stakeholders from government, international organizations, civil society and the private sector constitute the basis for finding joint solutions to these challenges.

II. Selected achievements

A. Sustainable management and use of land resources

12. The focus of Agenda 21 on an integrated approach to the planning and management of land resources has been reflected in subsequent international agreements and in national policy-making. A number of countries have elaborated national policies and procedures for integrated land-use planning and have introduced changes in land administration and land tenure leading to improvements in land resources conservation, management practices and food security. The preparation and implementation of national and regional action programmes to combat desertification have also been undertaken by many countries, particularly developing countries.

B. New agricultural technologies

13. Globally, the adoption of improved production technologies over recent decades has resulted in major food production increases and has averted the mass starvation that was once predicted. Since the United Nations Conference on Environment and Development, total cereal yield increases have more than compensated for the 2 per cent decrease in land under cereals. Unfortunately, many countries, especially in Africa, have not benefited equally in respect of technology adoption and food increases. However, recent improved cassava production in Nigeria and Ghana and the rapid adoption of integrated pest management in various countries, among other successes, demonstrate that African farmers can effectively take advantage of new technologies when given appropriate opportunities. Innovative solutions and tools can be effective for SARD only if they are combined and adapted to specific situations. The choices raise important ethical, social and cultural — as well as technical and environmental — questions for public decision-making.

14. Recent events illustrate the promise and peril of some new agricultural technologies, signalling the threshold of a new age in improving plants for human uses. In 2000, the first complete genetic mapping of a plant was accomplished. The sterile insect technique (SIT) is proving very effective in controlling and even eradicating some pests, inter alia, in more than 15 million hectares of hybrid rice plantings in six Asian countries. On the other hand, each announcement of a new case of "mad cow disease" (bovine spongiform encephalopathy (BSE)) or of cross-fertilization of genetically modified crops with wild species or landraces heightens public concern over the implications of technological advances.

15. With increased consumer awareness largely motivated by health concerns, markets for organically grown crops and livestock and specialist products, such as fruits, vegetables and flowers, have expanded dramatically, offering new opportunities for many farmers in developed countries and some developing countries with good export links. The adoption of new technologies for cereal crops, such as rice in Asia, has often not brought poverty relief to smallholder farmers because of falling commodity prices.

16. In summary, gains have been made, but the technologies required to escape rural poverty are generally not reaching the most needy. In an increasingly competitive world, this means the continued marginalization of the rural poor in many developing countries. To address these problems, initiatives have been launched such as the FAO Special Programme for Food Security (SPFS), which is currently active in two thirds of the low-income, food-deficit countries. Globally, agencies and organizations, including the United Nations University (UNU) and the Consultative Group on International Agricultural Research (CGIAR) increasingly involve resource users in decision-making and as integral research partners in order to address the needs of developing countries and fragile ecosystems more effectively.

C. Governance, decentralization and the role of civil society

17. An emphasis on good governance and collective action at the most appropriate level with all relevant stakeholders has become commonly accepted since the United Nations Conference on Environment and Development. For example, countries have systematically developed National Action Programmes (NAPs) for the implementation of the United Nations Convention to Combat Desertification through a consultative process involving all stakeholders including non-governmental organizations.[14] Similarly, regional and subregional action programmes have been developed for implementation of cross-border issues.

Administrative and financial problems have proved major obstacles to agricultural production, natural resource management and investment worldwide. In extreme cases, the progressive collapse of ineffective systems of governance has culminated in instability, political crisis and conflict-based emergencies for millions of people. Over the last 10 years, civil society and private sector organizations have increasingly been engaged directly in the conception, planning, execution and evaluation of programmes affecting land use and agriculture in collaboration with Governments.

18. Worldwide, more and more farmers' associations, farmers' cooperatives, farm workers' unions, women's organizations and other groups have joined to create umbrella confederations for larger representation and a stronger voice at the national and higher levels. International technical and financial support has assisted in the restructuring and decentralization of rural institutions, capacity-building for local government and farmer organizations and the strengthening of institutional mechanisms for multi-stakeholder dialogue and collaboration. At the local level, strategies, approaches and actions for sustainable agriculture, land and natural resource management and rural development advocated, inter alia, by the non-governmental organization community have contributed to family-scale, knowledge-based, complex agro-ecological systems.

19. During the past 10 years, the trend of participatory processes in agricultural research, extension and community development as well as combating desertification has been positive. The network of National Agricultural Research Systems (NARS) and the Global Forum on Agricultural Research (GFAR) are promoting wider partnerships for developing agricultural research and technology transfer. Programmes in the CGIAR system, including the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), the International Centre for Research in Agroforestry (ICRAF) and the International Institute of Tropical Agriculture (IITA), are applying a similar approach with success. These programmes have sought to improve the efficiency of existing research and development efforts. Increasingly, they are also working with local communities and civil society as full colleagues to achieve their goals.

D. Information and communication tools for improved decision-making

20. Compared with 10 years ago, there is now generally better knowledge and understanding of information on land and water resources, and agricultural and environmental issues as well as wider and more timely dissemination, as a result of the steadily decreasing costs of rapidly evolving modern information technologies and decision-making tools.

21. Examples of environmental information networks include UNEP's Global Resource Information Database (GRID), its Earth Resources Observation Systems (EROS) Data Centre, and the recently launched "UNEP dot Net", an interactive environmental web site. Various satellite observation systems managed by a number of United Nations agencies and national space agencies provide for rapid data analysis. The FAO Global Information and Early Warning System for Food and Agriculture (GIEWS) and Food Insecurity and Vulnerability Information and Mapping System (FIVIMS) provide information on immediate needs as well as the nature of persistent food deficiency and poverty, based on vulnerability analysis and risk assessment, with implications for agricultural productivity, sustainability and rural livelihoods.

22. Progress in implementing integrated land-use and agricultural policies has been constrained in many countries by the lack of sufficient and harmonized information on specific land areas, their location, tenure status and present use and the absence of a reliable land registration system and land administration. Such basic knowledge of multiple land-related factors is important in drawing up and negotiating land-use plans and in monitoring their implementation. The increasing use of geographical information systems (GIS) allows the combined analysis of natural resources and socio-economic information which is proving extremely valuable; however, efforts are needed to improve networking and updating of information at the national and provincial levels.

E. International agreements and mechanisms

23. Since the United Nations Conference on Environment and Development, many international

agreements and instruments have been adopted and programmes of action and projects developed at the international, regional and national levels that address the management of land and SARD from various perspectives.

24. In response to widespread concern that undernutrition still affects over 800 million people worldwide despite substantial increases in food supplies, and emphasizing the urgent need to take immediate action to "achieve food security for present and future generations", Governments at the 1996 World Food Summit in Rome adopted the Rome Declaration on World Food Security and the World Food Summit Plan of Action, with its goal of halving the number of undernourished in the world by 2015. Recent FAO studies have indicated that progress to date in reaching this target is not on track and the goal will not be met unless significant actions and policy changes occur. A five-year review of implementation of the Summit's objectives will take place in November 2001 as part of the biennial Conference of FAO.[15]

25. Governments are currently revising the International Undertaking on Plant Genetic Resources[16] to be in harmony with the Convention on Biological Diversity, which includes arrangements for benefit-sharing, access and ensuring "farmers' rights". In 1996, member countries of the Commission on Genetic Resources for Food and Agriculture adopted both the Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture[17] and the *Report on the State of the World's Plant Genetic Resources for Food and Agriculture*.[18] Similar assessments are currently under way for animal genetic resources.

26. Agreements that encourage the international harmonization of food standards include the FAO/WHO Codex Alimentarius, the guide for consumers, food producers and processors, national food control agencies and the international food trade, and the related World Trade Organization Agreement on the Application of Sanitary and Phytosanitary Measures.[19] The depth of concern about the impacts of industry and agriculture on food and the environment is demonstrated by the implementation of Prior Informed Consent procedures for chemicals and the recently concluded negotiations regarding persistent organic pollutants.

27. The International Strategy for Disaster Reduction, created in 2000 as the successor arrangement to the International Decade for Natural Disaster Reduction, is premised on the need to proceed from protection against hazards to the management of risk through the integration of risk reduction techniques into sustainable development.

28. In addition, regional coordination mechanisms as well as financial mechanisms and instruments, such as the Global Environment Facility (GEF) and the Global Mechanism of the Convention to Combat Desertification, have been created for the purpose of facilitating the implementation of the United Nations Conference on Environment and Development related conventions and their programmes of action. Over the last five years or so, the GEF has given increased importance to land degradation in the context of climate change and loss of biodiversity.

III. Issues for further consideration

29. The contradiction of severe poverty and undernourishment in the midst of unparalleled plenty still remains. The loss of land resources and increasing severity and extent of land resource degradation continue in spite of enhanced techniques and knowledge. Our understanding of the mechanisms and factors affecting desertification and drought is still limited. The direct and indirect impacts of technologies and the scale of the global economy have had profound implications for, and some pernicious effects on, sustainable agriculture, land use and fragile ecosystems.

30. The further need for long-term resource management strategies is clear, particularly in most of the low-income, food-deficit countries, in which food shortages and poverty tend to be associated with the unsustainable, extractive use of resources which results in land degradation and desertification; and in higher-income, food-secure countries, land degradation tends to result from the overuse of agricultural inputs, with negative effects on the environment and longer-term economic sustainability. The implementation of Agenda 21, the Convention to Combat Desertification, the Convention on Biological Diversity, the International Strategy for Disaster Reduction, the World Food Summit Plan of Action and other conventions and decisions adopted by key international conferences can provide new impetus and opportunities

for land resources inventories, evaluation, planning and management activities.

31. Issues for further consideration at the national level include:

(a) Renewal of emphasis on the agricultural sector and especially on rural infrastructure and institutions;

(b) Support, including additional financial resources, for the full implementation of existing international and national regulatory instruments dealing with land management and SARD;

(c) Creation of coordination mechanisms for the continuing interaction of Governments with civil society, including non-governmental organizations, the scientific community, local authorities and the private sector;

(d) Better inter-ministerial harmonization of policies, strategies and programmes for, for example, land use, integrated ecosystem management, SARD and integrated resource management.

32. Issues for further consideration at the international level include:

(a) The harmonization of related international conventions and frameworks and strengthening of their regional and international coordination mechanisms;

(b) A review of the extent to which international legal instruments and mechanisms are being implemented and provision of further assistance, where needed, to countries to implement their commitments to these agreements;

(c) Support to developing countries and other countries requiring it for building their intellectual, institutional and financial capacities for improved land use and SARD;

(d) A shift from a response-oriented approach towards longer-term proactive operations of vulnerability reduction and protection aimed at promoting sustainable development.

Notes

[1] *Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992*, vol. I, *Resolutions Adopted by the Conference* (United Nations publication, Sales No. E.93.I.8 and corrigendum), resolution 1, annex II.

[2] For further information, see FAO, *The State of Food and Agriculture, 2000* (Rome, 2000) and FAOSTAT databases available at www.fao.org. Also FAO, *The State of Food Insecurity in the World, 2000* (Rome, 2000). See also the report of the Secretary-General on sustainable agriculture and rural development submitted to the eighth session of the Commission on Sustainable Development (E/CN.17/2000/7 and addenda).

[3] See World Bank, *World Development Report 2000/2001: Attacking Poverty* (New York, Oxford University Press, 2000), foreword; for details, see www.worldbank.org/poverty/data/trends/index.htm.

[4] *Report of the World Food Summit (13-17 November 1996), Part one* (Rome, FAO, 1997), appendix, World Food Summit Plan of Action, para. 7, and United Nations Millennium Declaration (General Assembly resolution 55/2), para. 19. "Hunger" and "undernourishment" are often used interchangeably to mean food intake that is insufficient to meet dietary energy requirements continuously. "Food security" is a term used to describe access to the food required for a healthy and productive life; food security is often considered at the household level.

[5] International Fund for Agricultural Development (IFAD), *Drylands: A Call to Action* (Rome, December 1998); and UNEP, *Global Environment Outlook 2000* (Nairobi, UNEP, 1999).

[6] United Nations, *Treaty Series*, vol. 1954, No. 33480.

[7] IFAD, *Rural Poverty Report, 2001: The challenge of Ending Rural Poverty* (New York, Oxford University Press, 2001).

[8] See also decision 8/4 on agriculture adopted by the Commission on Sustainable Development at its eighth session (see *Official Records of the Economic and Social Council, 2000, Supplement No. 9* (E/2000/29), chap. I, sect. B).

[9] See FAO and FAOSTAT references in note 2 above, and also UNDP, UNEP, World Bank and World Resources Institute, *World Resources 2000-2001: People and Ecosystems: The Fraying Web of Life* (Washington, D.C., 2000).

[10] FCCC/CP/1997/7/Add.1, decision 1/CP.3, annex.

[11] United Nations, *Treaty Series*, vol. 1771, No. 30822.

[12] See United Nations Environment Programme, *Convention on Biological Diversity* (Environmental Law and Institution Programme Activity Centre), June 1992.

[13] A recent report by FAO estimates that some 60 million people in 33 countries are currently facing food emergencies of varying intensity caused by civil strife and/or weather-related disasters. See FAO, Foodcrops and Shortages (Rome, 2001), available at

http://www.fao.org/WAICENT/faoinfo/economic/giews/english/fs/fstoc.htm

[14] Currently, there are over 170 reports on the implementation of the United Nations Convention to Combat Desertification prepared by the parties to the Convention. The Ad Hoc Working Group, established by the Conference of the Parties to the Convention at its fourth session will meet from 19 March to 6 April 2001 to carry out an in-depth review and analysis of the reports and identify: (a) best practices and successes in implementing the Convention; (b) main difficulties, obstacles and challenges in implementing the Convention; (c) level of participation of all actors, including financial and technical support from developed countries, in the implementation process; and (d) linkages and synergies with other conventions on the environment and development.

[15] See Rome Declaration on World Food Security (*Report of the World Food Summit (13-17 November 1996), Part one* (Rome, FAO, 1997), appendix), para. 6; and note 4 above.

[16] Adopted by the FAO Conference at its twenty-second session, Rome 1983, in resolution 8/83. The undertaking is contained in the annex thereto. Text available at ftp://ext-ftp.fao.org/waicent/pub/cgrfa8/res/C8-83E.pdf. Accessed on 9 April 2001.

[17] *Report of the International Technical Conference on Plant Genetic Resources, Leipzig, Germany, 17-23 June 1996* (FAO, ITCPGR/96/REP), annex 2.

[18] Rome, FAO, 1997.

[19] See *Legal Instruments Embodying the Results of the Uruguay Round of Multilateral Trade Negotiations, done at Marrakech on 15 April 1994* (GATT secretariat publication, Sales No. GATT/1994-7).